NEC

**MODELS** **MultiSync 75F-3**
**AccuSync 75F-3**
**(N0701-3)**

COLOR MONITOR

# SERVICE MANUAL

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# WARNING

The SERVICE PERSONNEL should have the appropriate technical training knowledge and experience necessary to :

- Be familiar with specialized test equipment, and
- Be careful to follow all safety procedures associated with high voltage CRT circuit designs to minimize danger to themselves and their coworkers.

To avoid electrical chocks, this equipment should be used with an appropriate power cord and be connected only to a properly grounded AC outlet

This equipment utilized a micro-gap power switch. Turn off the monitor by first pushing the front panel power switch. Next, remove the power cord from the AC outlet.

To prevent fire or shock hazards, do not expose this unit to rain or moisture

This symbol warns the personnel that un-insulated voltage within the unit may have sufficient magnitude to cause electric shock.

This symbol alerts the personnel that important literature concerning the operation and maintenance of this unit has been included.
Therefore, it should be read carefully in order to avoid any problems.

# PRODUCT SAFETY CAUTION

1. When parts replacement is required for servicing, always use the manufacturer's specified replacement.
2. Comply with all caution and safety-related notes on the product display chassis and picture tube.
3. When replacing the component, always be certain that all the components are put back in the place.
4. When servicing display monitor unit, it is required that the provided lead dress is used in the high voltage circuit area.
5. It is also recommended that shatter proof goggles are worn, when removing, installing and handling the picture tube. People not equipped with the proper precautionary measures mentioned should keep the picture tube away from body while handling.
6. As for a connector, pick and extract housing with fingers properly since a disconnection and improper contacts may occur, when wires of the connector are led.
7. Use a proper screwdriver. If you use screwdriver that does not fit, you may damage the screws.

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# Precautions

Follow these safety and servicing precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

## 1.1 Safety Precautions

### 1-1-1 Warnings

1. For safety purpose, do not attempt to modify the circuit board, and always disconnect the AC power before performing servicing on the monitor.
2. Operation of the monitor outside its cabinet or with the cover removed involves the risk of shock hazard. Repair work on the monitor should only be attempted by service personnel who are thoroughly familiar with all necessary safety precautions and procedures for working on high voltage equipment.
3. Do not lift the CRT by the neck. After completely discharging the high voltage anode, handle the CRT only when wearing shatterproof goggles. Try to keep the CRT away from the body during handling.
4. High voltage should always be kept at the rated value, no higher. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
5. The CRT is especially constructed to limit X-ray emission to 0.5mR/HR at 300 microamperes anode current. To ensure continued X-ray protection, replace the CRT with only the same or equivalent type as the original, and adjust the anode's voltage to the designated maximum rating, never to exceed.

### 1-1-2 Safety Checks

Before returning the monitor to the user, perform the following safety checks:

1. Inspect to make certain that each lead dress is not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. AC Leakage Current Check
   Always perform the AC Leakage Current Check on the exposed metal parts, including metal cabinets, screwheads and control shafts, as follows:
   a) Plug the AC line cord directly into a rated AC outlet. Do not use an isolation transformer during the check.
   b) Use an AC voltmeter with at least 5000 ohms per volt sensitivity as follows:
   Connect a 1500 ohms, 10 watt resistor paralleled by a 0.15uF AC capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduct or electrical ground connected to earth ground, as shown in the Figure 1-1. Measure the AC voltage across the combination of resistor and capacitor.



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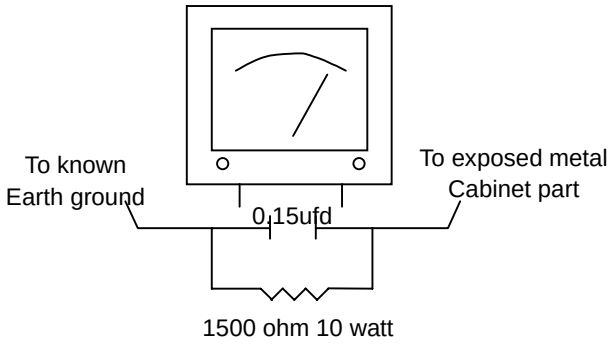
Figure 1-1. Set Up For AC Leakage Current Check




c) Reverse the AC plug at the AC outlet and repeat the steps for AC voltage measurements for each exposed metal part.
d) Voltage reading must not exceed 0.3 volts RMS, equivalent to 0.2 milliampere AC. Any value exceeding this limits ill constitute a potential shock hazard and must be corrected immediately

### 1-1-1 Product Safety Notices

Many electrical and mechanical parts in this chassis have special safety-related characteristics which are often not evident from visual inspection. The protection afforded by them may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Before replacing any of these components, consult the Recommended Spare Parts List given at the end of this manual. Any of the replacements that do not provide the same safety characteristics may result in shock, fire, X-ray emission or other hazards.

## 1.2 Servicing Precautions

**Warning:** An electrolytic capacitor installed with the wrong polarity might explode.

**Caution:** Before performing servicing covered by this service manual, read and follow the Safety Precautions section of this manual.

**Note:** If unforeseen conflict between the following servicing precautions and of the safety precautions, always follow the safety precautions

1. Follow closely the servicing precautions printed on the monitor cabinet and chassis.
2. Always unplug the AC power cord from the AC power source before removing or installing any component or assembly, disconnection PCB plugs or connectors and connecting a test component in parallel with a capacitor.
3. When replacing parts or circuit boards, clamp the lead wires around the unit before soldering.
4. When replacing a high wattage resistor (>0.5W metal oxide film resistor) in the circuit board, keep the resistor about 1 cm (1/2 inch) away from the circuit board.
5. Keep wires away from the high voltage or high temperature components.
6. Keep wires in their original positions so as to minimize interference.
7. Always connect a test instrument’s ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument’s ground lead last.



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**Specifications**

| Monitor Specifications | | MultiSync 75F<br>AccuSync 75F | Notes |
|---|---|---|---|
| Picture Tube | Diagonal:<br>Viewable Image Size: | 43cm(17inch)<br>41cm(16inch) | 90° deflection, 0.25mm trio dot pitch, medium short persistence phosphor, multi-layered, anti- static screen coating, semi-tint screen, Invar Shadow Mask and OptiClear screen. (AS75F: 0.24-0.28 mm variable(diagonal) flat dot pitch, 0.20-0.25 mm variable(horizontal) flat dot pitch.) |
| Input Signal | Video:<br>Sync: | ANALOG 0.7Vp-p/75 Ohms<br>Separate sync. TTL Level<br>Horizontal sync. Positive/ Negative<br>Vertical sync. Positive/Negative<br>(MS75F: Composite sync. (Positive/Negative) (TTL Level) | |
| Display Colors | Analog input: | Unlimited number of Colors | Depends on display card used. |
| Synchronization Range | Horizontal:<br>Vertical: | 31 kHz to 70 kHz<br>55 Hz to 120 Hz | Automatically<br>Automatically |
| Resolutions Supported<br>Resolution based on horizontal and vertical frequencies only | | 640 × 480 @ 60 to 120 Hz<br>800 × 600 @ 55 to 110 Hz<br>832 × 624 @ 55 to 106 Hz<br>1024 × 768 @ 55 to 87 Hz ……<br>1152 × 870 @ 55 to 77 Hz<br>1280 × 1024 @ 55 to 66 Hz | Some systems may not support all modes listed.<br><br>NEC-Mitsubishi Electronics Display cites recommended resolution at 85 Hz for optimal display performance. |
| Active Display Area (Factory Setting) | Horizontal:<br>Vertical: | 310 mm/12.2 inches<br>232 mm/9.1 inches | Dependent upon signal timing used, and does not include border area. |
| Active Display Area (Full Scan) | | 325 mm/12.8 inches<br>243 mm/9.6 inches | Dependent upon signal timing used, and does not include border area. |
| Power Supply | | AC 100 - 240V, 50 - 60Hz | |
| Current Rating | | 1.5A @ 100 - 240V | |
| Dimensions | | 403(W) × 420(H) × 420(D) mm<br>15.9(W) × 16.5(H) × 16.5(D) inches | |
| Weight (Net) | | 16.4 kg<br>36.8 lbs | |
| Environmental Considerations | | | |
| | Operating Temperature:<br>Humidity:<br>Altitude:<br>Storage Temperature:<br>Humidity:<br>Altitude: | 0° C to + 35° C<br>30% to 80%<br>0 to 3000 m<br>-20° C to + 60° C<br>10% to 90%<br>0 to 13700 m | |

NOTE: Technical specifications are subject to change without notice.



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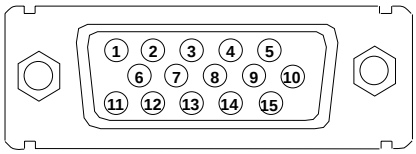
## PIN ASSIGNMENT




| PIN NO. | Mini D-SUB-15P |
|---|---|
| 1 | RED |
| 2 | GREEN |
| 3 | BLUE |
| 4 | GROUND |
| 5 | GROUND |
| 6 | RED GROUND |
| 7 | GREEN GROUND |
| 8 | BLUE GROUND |
| 9 | +5V in |
| 10 | GROUND |
| 11 | GROUND |
| 12 | SDA |
| 13 | H.SYNC. |
| 14 | V.SYNC. |
| 15 | SCL |



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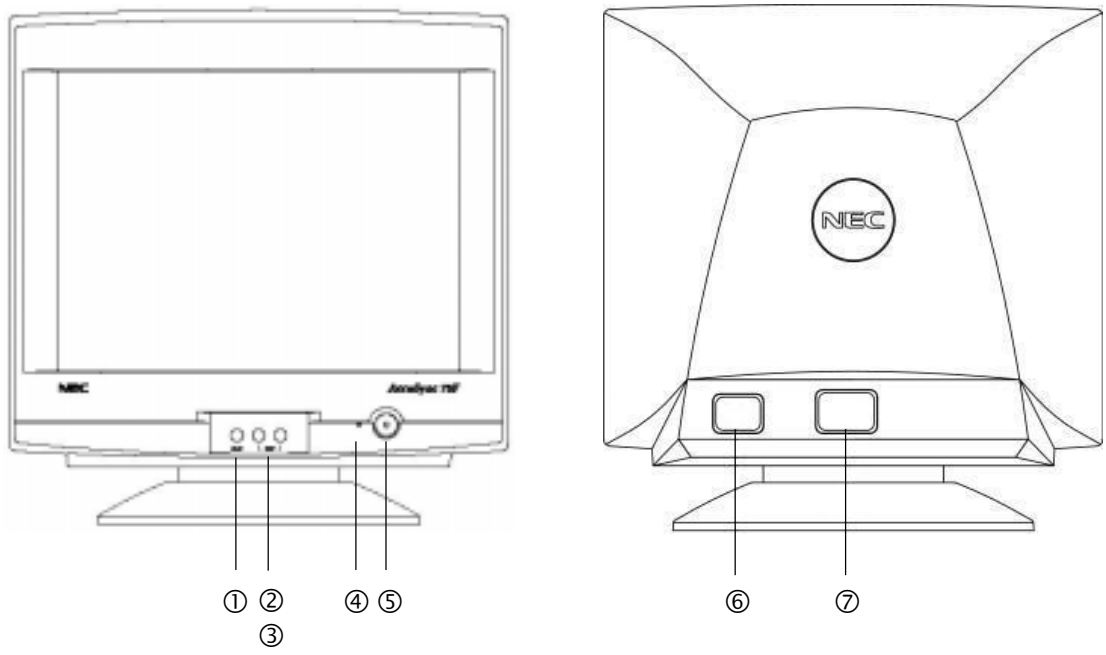
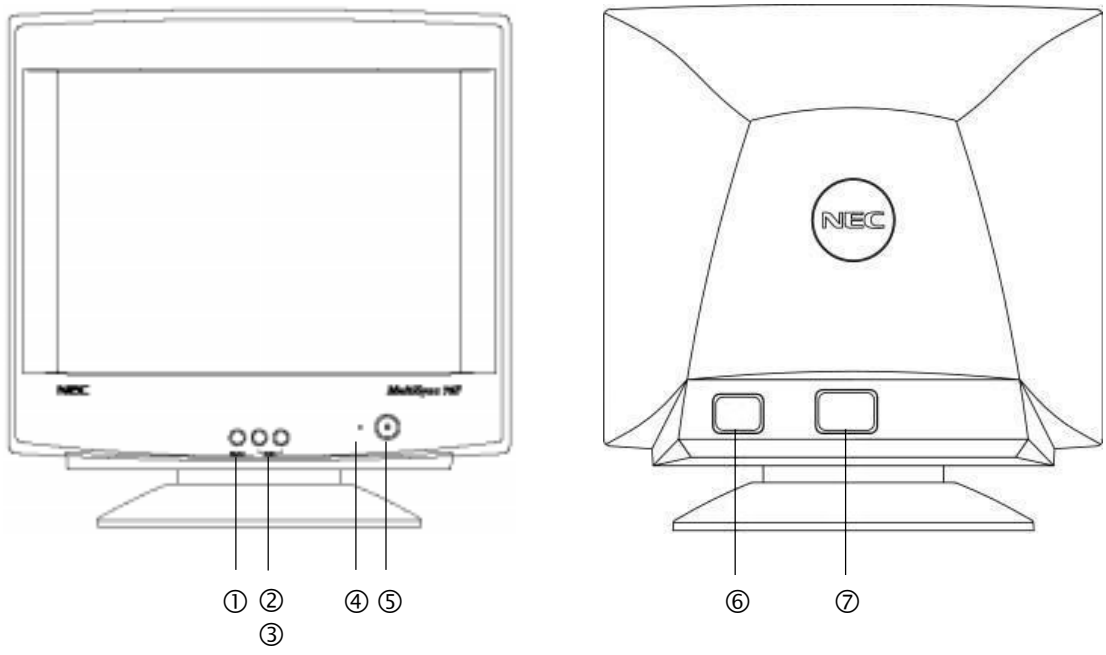
## CONTROLS

① ”SELECT”: To display OSM windows, mode changes, or activate the degaussing or OSM window color selection.
② CONTROL BUTTON (-,+): Without OSM — Adjust the contrast.
With OSM — Select icon and adjust.
③ ”RESET”: Return the adjustment item to the factory setting.
④ Power indicator LED: The LED indicate Power management state.
⑤ POWER SWITCH: Push/push to turn the monitor on and off.
⑥ Power input: To connect with the power cord.
⑦ Signal input with the captive cable: To connect with personal computers’ analogue RGB output.



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## OSD OPERATION

- FUNCTION VALUE ADJUSTMENT

  If OSD off, press UP key to increase Contrast value,

  press DOWN key to decrease Contrast value.

  press SELECT key to display OSD and Brightness icon is active (Fig. 1)

**Fig. 1**

Press UP key or DOWN key to select icon right or left and the selected icon display red color
If selected icon is DAC out, press SELECT key will display DAC value bar (fig 2)

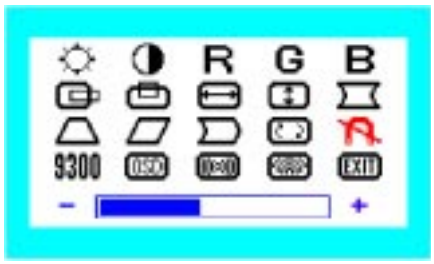


**Fig. 2**

User can press UP key or DOWN key to adjust DAC value.
Press SELECT key to close DAV value bar and UP key or DOWN key to select the other icon.

- SPECIAL FUNCTION OPERATION

1. Degauss Active

   If selected icon is degauss icon, press SELECT key to activate degauss (Fig. 3).

**Fig. 3**



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2. Color Temperature Select

If selected icon is 9300/7500/6500/user color icon, press SELECT key to select Color Temperature for 9300, 7500, 6500 or user defined (Fig 4 – 7).

**Fig. 4**

**Fig. 5**

**Fig. 6**

**Fig. 7**

3. OSD Color Select

If OSD icon is selected, press SELECT key to change OSD color, there are three kinds of OSD color can be selected (Fig. 8 – 10).

**Fig. 8**

**Fig.9**

**Fig. 10**

| | | | |
|---|---|---|---|
| Background | white | blue | black |
| Action icon | red | red | red |
| Normal icon | black | white | white |
| Value bar | blue | yellow | green |

4. SYNC OSD Display

If EXIT icon is selected, press SELECT key to close OSD menu and then display sync information for 2 sec. This sync information will not be close until release SELECT key (Fig. 11).

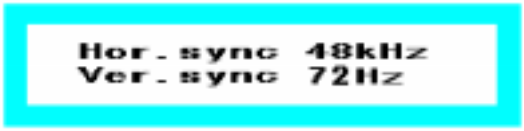


**Fig. 11**



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5. Factory mode

Press SELECT key + UP key and power on, system enter factory mode.

OSD will display “FA” to indicate in factory mode (Fig. 12 – 13).

**Fig. 12**

**Fig. 13**

Operation of factory mode is same as normal mode except below 2 condition:

a. Adjustment value is saved to user and factory area.

b. R, G, B value are saved to current color temperature.

**P2** Self Test Pattern Select

P1: Full White Pattern

P2: Cross Hatch Pattern

NP: No Pattern (Power Saving)

**SS** Sub Size Do not adjust.

OSD Position H

OSD Position V

**VL** Vertical Linearity IN ↔ OUT

**VB** Vertical Linearity Balance Top ↔Bottom

**HM** Horizontal Moire: Minimum

**VM** Vertical Moire: Minimum

**HC** Side Pin Corner

**HF** Horizontal Dynamic Focus: Min

**VF** Vertical Dynamic Focus: Max

**AB** ABL Adjustment



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## Function explanation

**OSD(On-screen Display) control buttons on the front of the monitor function as follows:**

**SELECT** Enters and exits the OSD menu.

**– / +** Selects one of the controls and increases or decreases the adjustment.

**RESET** Resets the highlighted control to the factory Setting.
Press -/+button at the same time for approximately 1 sec.

**Brightness:** Adjusts the overall image and background screen brightness.

**Contrast:** Adjusts the image brightness in relation to the background.
(Contrast control is also effective with "-, +" button even through OSD window is not visible.)

**R** **Red Color Control**: Adjust the red contrast of the display.

**G** **Green Color Control**: Adjust the green contrast of the display.

**B** **Blue Color Control**: Adjust the blue contrast of the display.

**Horizontal position:** Moves the image horizontally left or right.

**Vertical position:** Moves the image vertically up or down.

**Horizontal size:** Decreases or increases the horizontal size of the image.

**Vertical size:** Decreases or increases the vertical size of the image.

The **Geometry** controls allow you to adjust the curvature or angle of the sides of your display.

**Pincushion/Barrel:** Decreases or increases the curvature of the sides either inward or outward.

**Trapezoid:** Decreases or increases the bottom of the screen to be the same as the top.

**Parallelogram:** Decreases or increases the tilt of the sides either to the left or right.

**Bow (Pincushion Balance):** Decreases or increases the curvature of the sides either left or right.

**Rotation:** Rotate the image.



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**Degauss**: Select the degauss icon on “Icon select window” and push “SELECT” button.

It will eliminate the stray magnetic field and correct the scan of the electron beam, which affect the purity, focus, convergence.

**Note:** Allow a minimum interval of 20 minutes to elapse between uses of the degauss function.

9300K **Color Temperature:** Select the Color Temperature icon on “Icon Select Window” and push “SELECT” button.

**OSD**: There are 3 background colors (Blue, Black, and white). These can be selected by “SELECT” button after the selection of “OSM” on “Icon select window”.

exit **EXIT**: To exit the OSM window. Select EXIT on “Icon select window”, then push “SELECT” button.

**Note:** If you do not push buttons within 10 seconds in OSD condition, the window will automatically disappear.

**Horizontal Moire Canceler:** Reduces horizontal moire levels.

**Vertical Moire Canceler:** Reduces vertical moire levels.



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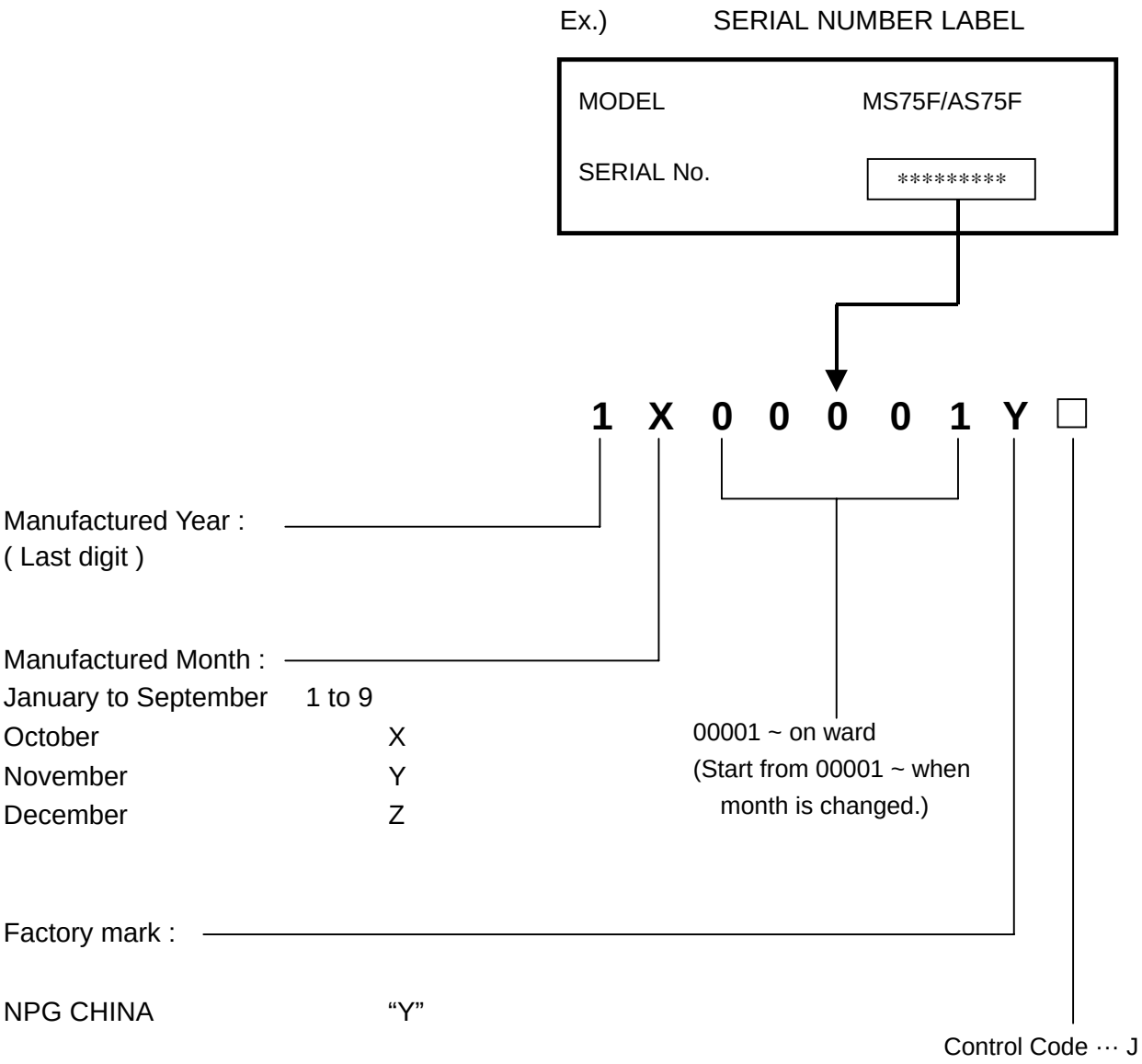
## SERIAL NUMBER INFORMATION

Refer to the serial number information shown below.



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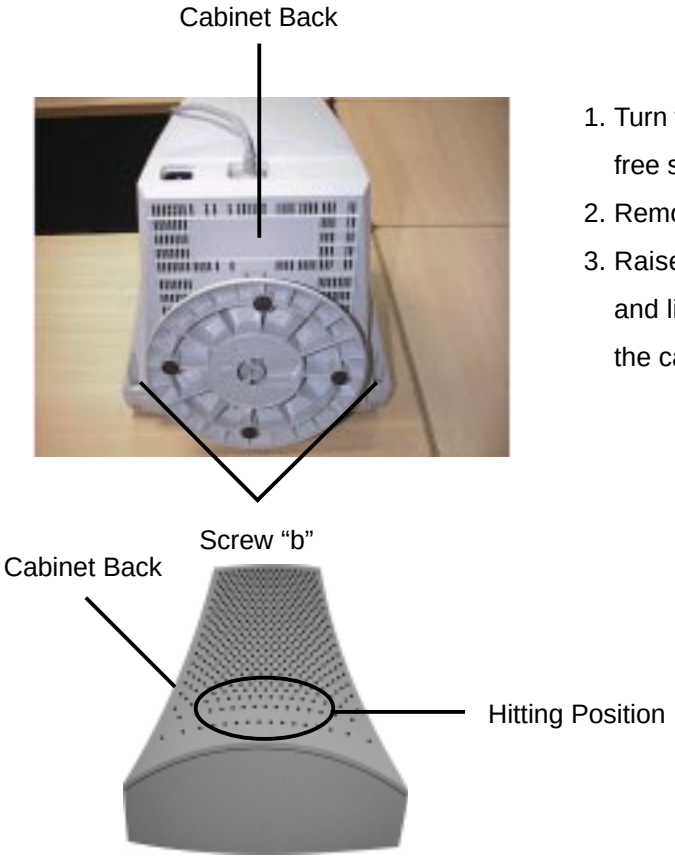
## DISASSEMBLY

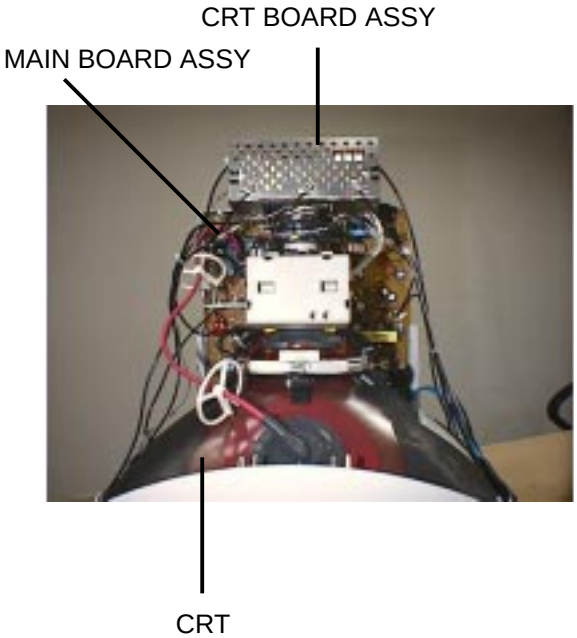
### Cabinet Back




1. Turn the monitor CRT face down on a clean static free surface to prevent scratching CRT face.
2. Remove the screw “b”.
3. Raise the signal cable vicinity of a cabinet back and lightly hit part (figure 1 reference) of a top of the cabinet back and remove the cabinet back.

Fig. 1

### MAIN BOARD and CRT BOARD




1. Unsolder the GND wire from MAIN BOARD ASSY
2. Disconnect the connector “P201”, “P202”, “S204” and “S205” from the CRT BOARD ASSY
3. Disconnect the CRT BOARD ASSY from the CRT
4. Disconnect the connector “S301” and “P102” from the MAIN BOARD ASSY.
5. Remove the Anode Cap from the CRT.

   **NOTE:**

   Carefully discharge the CRT anode by shorting it to ground before removing Anode Cap.
6. Lift up the MAIN BOARD ASSY from the Cabinet Front ASSY.



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# ADJUSTMENT SPECIFICATIONS

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(1) Adjustment & Inspection Tools:

(A) Color Analyzer
(B) Signal Generator CHAROMA 2135
(C) Multi Meter
(D) Hi-Voltage Probe
(E) Convergence Meter
(F) Demagnetizer Probe
(G) Power Meter
(H) Automatic Alignment System
(I) DDC write & inspection system

(2) TIMING TABLE(Factory Mode -20 MODES)

| MODE | RESOLUTION | H-SYNC EREQ. | V-SYNC FREQ | H . POLARITY | V . POLARITY |
|---|---|---|---|---|---|
| 1 | VGA350 | 31.5KHz | 70Hz | + | - |
| 2 | VGA400 | 31.5kHz | 70Hz | - | + |
| 3 | VGA480 | 31.5KHz | 60Hz | - | - |
| 4 | MAC 35K | 35.0KHz | 66Hz | - | - |
| 5 | 800*600(56) | 35.2KHz | 56Hz | + | + |
| 6 | 8514A | 35.5KHz | 87Hz | + | + |
| 7 | 640*480(75) | 37.5KHz | 75Hz | - | - |
| 8 | EVGA400 | 37.8KHz | 84Hz | - | + |
| 9 | 800*600(60) | 37.8KHz | 60Hz | + | + |
| 10 | 640*480 | 43.3KHz | 85Hz | - | - |
| 11 | 800*600(75) | 46.8KHz | 75Hz | + | + |
| 12 | 1024*768(60) | 48.3KHz | 60Hz | - | - |
| 13 | MAC 49K | 49.7KHz | 74Hz | - | - |
| 14 | 800*600(85) | 53.6KHz | 85Hz | + | + |
| 15 | 1024*768(70) | 56.4KHz | 70Hz | - | - |
| 16 | 1024*768(75) | 60.0KHz | 75Hz | + | + |
| 17 | 640*480(120) | 63.7KHz | 120Hz | - | - |
| 18 | 1280*1024(60) | 64.0KHz | 60Hz | + | + |
| 19 | 800*600(100) | 64.0KHz | 100Hz | + | + |
| 20 | 1024*768(85) | 68.6KHz | 85Hz | + | + |

(3) Definition for Normal Condition

(A) Input AC Voltage 110V/60HZ.
(B) Warm up time minimum30 minutes.
(C) Full White Pattern. See (4)-(C) Aging Mode.
(D) ALL VR's Adjust Center Position.
(E) Color temperature setting: 9300K
(F) OSD I-CON [R], [G], [B] gain control bar center position in Factory Mode

(4) Hot Key Operation

(A) Factory Mode: SELECT Key + UP (+) Key if pressed when the power SW on.
(OSD Position Control Mode is in Factory Mode Menu)
(B) Auto Alignment mode and DDC 2B Writing/Inspection Mode: Down (-) Key if pressed when the power SW on.



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(C) Auto Function Test Mode : UP (+) Key if pressed when the power SW on.
Mode 1: Out put the maximum and minimum value of DAC for each control if the video signal comes in.
Mode 2: Out put the Cross Hatch Pattern for 1 munites if the Signal Cable is not connected

(5) B+ Adjustment

(A) MODE: No. 12.
(B) Pattern: Full white. (Brightness just cut off)
(C) Adjust VR101 to make the cathode of D112 has 13.6V.
(D) Check other power source should be 82 ± 2V, 6.2V ± 0.3V, 49V ± 1.5V, -11.5V ± 0.5V.

(6) X-RAY Test

(A) Mode: No.12
(B) Pattern: Normal Crosshatch (Brightness just cut off)
(C) Test
Apply a resistor(39K, 1/4W, 1%) between TP1 and TP2 then power on, Monitor should be active in X-Ray protector.

(7) H. V. Confirmation

(A) Mode: No. 12
(B) Pattern: Full Black (Brightness just cut off)
(C) Check the high voltage is 25.5 ± 0.5kV.

(8) H-Raster Center Adjustment

(A) Mode: No. 18
(B) Pattern: Crosshatch Reverse
(C) Adjust the Brightness Control that the background can be visible.
(D) Change VR301 to make the back ground should be center off the CRT.

(9) Pre-Adjustment

(A) Mode: No. 12
(B) Pattern: Crosshatch
(C) Enter to Factory mode. Adjust H-phase, V-center, H-size, V-size, Pincushion, Trapezoid, Bow, Parallelogram and rotation to make Picture Position Center and Picture Size 310*232mm.

(10) White Balance Adjustment

(A) Setting
Enter Factory Mode,
Mode: No. 12, Pattern: Full White.
Warm up 30 min.
Make External Degauss.
**For SRGB adjust, please change mode to No.20**.



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(B) Cut Off Adjustment

1. Select the color Mode 9300K
2. Cut Off Adjustment: Video Signal Off (0.vp-p), Bright Control set to Mex., Adjust the G2, at the Brightness 1~1.5FL. (3.4~5.1 cd/m2)
3. Adjust VR210, VR230 and VR250 to make X=283, Y=297, with readjusting G2 to keep the brightness between 1~1.5FL (3.4~5.1 cd/m2).

(C) White Balance Adjustment (Factory Auto Adjustment)

1.9300K (Select the color Mode 9300K)

1) 50*50mm Green block Pattern, Brightness Control set to Max, Contrast Control set to Max, Adjust [G] gain control to Y=45FL. (154 cd/m2)
2) Change Pattern to Full White, Brightness control set to Min.
3) Adjust [R] gain control, [B] gain control to X=283, Y=297 at the contrast control is adjusted 15FL (52cd/m2).
4) Check the color tracking shall be X=283$\pm$15, Y=297$\pm$15 between Y=5~25FT-L (17~86cd/m2) condition.

2.7500K (Select the color Mode 7500K)

1) 50*50mm Green block Pattern, Brightness Control set to Max, Contrast Control set to Max, Adjust [G] gain control to Y=42FL. (144 cd/m2)
2) Change Pattern to Full White, Brightness control set to Min.
3) Adjust [R] gain control, [B] gain control to X=300, Y=315 at the contrast control is adjusted 15FL (52cd/m2).

3. Maximum Brightness Adjustment for 9300K and 7500K mode

1) Select 9300K mode.
2) Brightness control set to Max., Contrast control set to Max.
3) Adjust “AB” in Factory mode to Y=31FL (105cd/m2).

(D) “sRGB MODE” White Balance Adjustment (Select the color Mode sRGB)

1. Set “AB”(sRGB) to 150 counts of control bar. (Total 255)
2. Video Signal off (0 Vp-p), Contrast set to Max., Adjust Brightness to 0.1 cd/m2.
3. Change Pattern to 50*50 mm Green block, Adjust [G] gain control to Y=75 cd/m2 (22FL).
4. Change Pattern to 50*50 mm White block, Adjust [R] gain and [B] gain to X=313, Y=329.
5. Adjust contrast control to Y=88 cd/m2 (25.7FL).

(11) Convergence Adjust

(A) Mode: No. 12
(B) Pattern: Crosshatch.
(C) Use the convergence meter to check whether the convergence is within spec.
Adjust the CPC Magnet to make the convergence within spec.

(12) Power Saving Function Inspection

(A) Mode: No. 12
(B) Pattern: Any Pattern



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(C) Inspection

1. It should be into power off Mode when the both horizontal sync and vertical sync are disable after 4 sec. Check the LED color “Orange” and the power consumption must be less than 5W.
2. The picture should be recovered readable within 3 seconds when the both horizontal sync and vertical sync are enable. Check the LED color “Green”.

(13) Geometry Adjustment (Factory Auto Alignment)

(A) Power on with press (-) key.
(B) Adjust H-size, V-size, H-phase, V-phase, Pincushion, and Trapezoid for all preset signals.
(C) Adjustment data are automatically stored into the factory-preset memory after 1 sec.
Note: For the factory auto alignment, Mode No. 2, 3, 7, 9, 10, 11, 12, 14, 15, 16, 17, 19, 20 shall be adjusted. Other modes can be used the calculated average value.

(14) DDC 1/2B Writing and Inspection

(A) Power on with press (-) key. Any Mode, Any Pattern.
(B) Connect the MICON Tech. DDC Read/Write System.
(C) Scan bar code label and apply serial NO. to EDID Data.

**EDID data Table**

**AS75F**

| | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **A** | **B** | **C** | **D** | **E** | **F** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 38 | A3 | CF | 5D | 01 | 01 | 01 | 01 |
| 10 | 0A | 0A | 01 | 03 | 0C | 21 | 18 | 78 | EA | 57 | 98 | A4 | 52 | 46 | 97 | 24 |
| 20 | 11 | 48 | 4C | FF | EE | 00 | 31 | 59 | 45 | 59 | 61 | 59 | 71 | 4A | 81 | 40 |
| 30 | 01 | 01 | 01 | 01 | 01 | 01 | EA | 24 | 00 | 60 | 41 | 00 | 28 | 30 | 30 | 60 |
| 40 | 13 | 00 | 36 | E8 | 10 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 37 | 78 | 1F |
| 50 | 46 | 0B | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | 00 | 00 | 00 | FC | 00 | 41 |
| 60 | 63 | 63 | 75 | 53 | 79 | 6E | 63 | 20 | 37 | 35 | 46 | 0A | 00 | 00 | 00 | FF |
| 70 | 00 | 30 | 33 | 30 | 30 | 30 | 30 | 31 | 59 | 41 | 0A | 20 | 20 | 20 | 00 | 3C |

**MS75F**

| | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **A** | **B** | **C** | **D** | **E** | **F** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 38 | A3 | D1 | 5D | 01 | 01 | 01 | 01 |
| 10 | 0A | 0A | 01 | 03 | 0C | 21 | 18 | 78 | EA | 57 | 98 | A4 | 52 | 46 | 97 | 24 |
| 20 | 11 | 48 | 4C | FF | EE | 00 | 31 | 59 | 45 | 59 | 61 | 59 | 71 | 4A | 81 | 40 |
| 30 | 01 | 01 | 01 | 01 | 01 | 01 | EA | 24 | 00 | 60 | 41 | 00 | 28 | 30 | 30 | 60 |
| 40 | 13 | 00 | 36 | E8 | 10 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 37 | 78 | 1F |
| 50 | 46 | 0B | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | 00 | 00 | 00 | FC | 00 | 4D |
| 60 | 75 | 6C | 74 | 69 | 53 | 79 | 6E | 63 | 20 | 37 | 35 | 46 | 00 | 00 | 00 | FF |
| 70 | 00 | 30 | 33 | 30 | 30 | 30 | 30 | 31 | 59 | 41 | 0A | 20 | 20 | 20 | 00 | B5 |

Note: Week code, Year code, Serial No. depend on the Serial No. Label.



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(15) Setting Before Shipment

Color Temp 9300K
OSD Back Ground: Blue
OSD Position: Center of the screen
Contrast: Maximum
Brightness: Preset
H. V moire cancel function: Minimum
Self test pattern: Cross Hatch Pattern for 1 munites, if the Signal Cable is not connected.
(Select the “P2” in the “Factory Mode”)

(16) Adjustment Magnetic Field

Vertical: +40uT, Horizontal: +/-0uT(Neutral).



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(17) TIMING SHEET

Rev1.0

| Preset Mode No. | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Signal Name | | VGA350 | VGA400 | VGA480 | MACII (35K) | 800*600 (56) | 8514/A XGA |
| Resolution | | 640*350 | 640*400 | 640*480 | 640*480 | 800*600 | 1024*768 |
| Dot Clock | (MHz) | 25.175 | 25.175 | 25.175 | 30.240 | 36.000 | 44.900 |
| fh | (kHz) | 31.47 | 31.47 | 31.47 | 35.00 | 35.16 | 35.52 |
| fv | (Hz) | 70.09 | 70.09 | 59.94 | 66.67 | 56.25 | 86.96 |
| Total | (dot) | 800 | 800 | 800 | 864 | 1024 | 1264 |
| | (uS) | 31.78 | 31.78 | 31.78 | 28.57 | 28.44 | 28.15 |
| Disp | (dot) | 640 | 640 | 640 | 640 | 800 | 1024 |
| | (uS) | 25.42 | 25.42 | 25.42 | 21.16 | 22.22 | 22.81 |
| Front | (dot) | 16 | 16 | 16 | 64 | 24 | 8 |
| | (uS) | 0.64 | 0.64 | 0.64 | 2.12 | 0.67 | 0.18 |
| Sync Pulse | (dot) | 96 | 96 | 96 | 64 | 72 | 176 |
| | (uS) | 3.18 | 3.81 | 3.81 | 2.12 | 2.00 | 3.92 |
| Back | (dot) | 48 | 48 | 48 | 96 | 128 | 56 |
| | (uS) | 1.91 | 1.91 | 1.91 | 3.17 | 3.56 | 1.25 |
| Total | (H) | 449 | 449 | 525 | 525 | 625 | 408.5 |
| | (mS) | 14.268 | 14.268 | 16.683 | 15.000 | 17.778 | 11.500 |
| Disp | (H) | 350 | 400 | 480 | 480 | 600 | 384 |
| | (mS) | 11.122 | 12.711 | 15.253 | 13.714 | 17.067 | 10.810 |
| Front | (H) | 37 | 12 | 10 | 3 | 1 | 0 |
| | (mS) | 1.176 | 0.381 | 0.318 | 0.086 | 0.028 | 0.000 |
| Sync Pulse | (H) | 2 | 2 | 2 | 3 | 2 | 4 |
| | (mS) | 0.064 | 0.064 | 0.064 | 0.086 | 0.057 | 0.113 |
| Back | (H) | 60 | 35 | 33 | 39 | 22 | 20 |
| | (mS) | 1.907 | 1.112 | 1.049 | 1.114 | 0.626 | 0.563 |
| Interlace | | NON | NON | NON | NON | NON | YES |
| Polarity | (H/V) | POS/NEG | NEG/POS | NEG/NEG | NEG/NEG | POS/POS | POS/POS |
| Composite Sync | | | | | NEG | | |
| Composite Video | | | | | | | |
| Character Font | | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 |
| Serration | | OFF | OFF | OFF | ON | OFF | OFF |
| EQP | | OFF | OFF | OFF | OFF | OFF | OFF |



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| Preset Mode No. | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|
| Signal Name | 640*480 (75) | EVGA400 (VESA) | 800*600 (60) | 640*480 (85) | 800*600 (75) | 10*7(60) (VESA) |
| Resolution | 640*480 | 640*400 | 800*600 | 640*480 | 800*600 | 1024*768 |
| Dot Clock (MHz) | 31.500 | 31.5000 | 40.000 | 36.000 | 49.500 | 65.000 |
| fh (kHz) | 37.50 | 37.86 | 37.88 | 43.27 | 46.88 | 48.36 |
| fv (Hz) | 75.00 | 84.13 | 60.32 | 85.01 | 75.00 | 60.00 |
| Total (dot) | 840 | 832 | 1056 | 832 | 1056 | 1344 |
| (uS) | 26.67 | 26.41 | 26.40 | 23.11 | 21.33 | 20.68 |
| Disp (dot) | 640 | 640 | 800 | 640 | 800 | 1024 |
| (uS) | 20.32 | 20.32 | 20.00 | 17.78 | 16.16 | 15.75 |
| Front (dot) | 16 | 24 | 40 | 56 | 16 | 24 |
| (uS) | 0.51 | 0.76 | 1.00 | 1.56 | 0.32 | 0.37 |
| Sync Pulse (dot) | 64 | 40 | 128 | 56 | 80 | 136 |
| (uS) | 2.03 | 1.27 | 3.20 | 1.56 | 1.62 | 2.09 |
| Back (dot) | 120 | 128 | 88 | 80 | 160 | 160 |
| (uS) | 3.81 | 4.06 | 2.20 | 2.22 | 3.23 | 2.46 |
| Total (H) | 500 | 450 | 628 | 509 | 625 | 806 |
| (mS) | 13.333 | 11.886 | 16.579 | 11.76 | 13.333 | 16.666 |
| Disp (H) | 480 | 400 | 600 | 480 | 600 | 768 |
| (mS) | 12.800 | 10.565 | 15.840 | 11.093 | 12.800 | 15.880 |
| Front (H) | 1 | 9 | 1 | 1 | 1 | 3 |
| (mS) | 0.027 | 0.238 | 0.026 | 0.023 | 0.021 | 0.062 |
| Sync Pulse (H) | 3 | 3 | 4 | 3 | 3 | 6 |
| (mS) | 0.080 | 0.079 | 0.106 | 0.069 | 0.064 | 0.124 |
| Back (H) | 16 | 38 | 23 | 25 | 21 | 29 |
| (mS) | 0.427 | 1.004 | 0.607 | 0.578 | 0.448 | 0.600 |
| Interlace | NON | NON | NON | NON | NON | NON |
| Polarity (H/V) | NEG/NEG | NEG/POS | POS/POS | NEG/NEG | POS/POS | NEG/NEG |
| Composite Sync | | | | | | |
| Composite Video | | | | | | |
| Character Font | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 |
| Serration | OFF | OFF | OFF | OFF | OFF | OFF |
| EQP | OFF | OFF | OFF | OFF | OFF | OFF |



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| Preset Mode No. | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|
| Signal Name | MACII (49.7K) | 800*600 (85) | 10*7(70) (VESA) | 10*7(75) (VESA) | 640*480 (120) | 12*10(60) (VESA) |
| Resolution | 832*624 | 800*600 | 1024*768 | 1024*768 | 640*480 | 1280*1024 |
| Dot Clock (MHz) | 57.286 | 56.250 | 75.000 | 78.750 | 55.00 | 108.000 |
| fh (kHz) | 49.73 | 53.67 | 56.48 | 60.02 | 63.66 | 63.98 |
| fv (Hz) | 74.55 | 85.06 | 70.07 | 75.03 | 120.11 | 60.02 |
| Total (dot) | 1152 | 1048 | 1328 | 1312 | 864 | 1688 |
| (uS) | 20.11 | 18.63 | 17.71 | 16.66 | 15.71 | 15.63 |
| Disp (dot) | 832 | 800 | 1024 | 1024 | 640 | 1280 |
| (uS) | 14.52 | 14.22 | 13.65 | 13.00 | 11.645 | 11.85 |
| Front (dot) | 32 | 32 | 24 | 16 | 32 | 48 |
| (uS) | 0.56 | 0.57 | 0.32 | 0.20 | 0.582 | 0.44 |
| Sync Pulse (dot) | 64 | 64 | 136 | 96 | 96 | 112 |
| (uS) | 1.12 | 1.14 | 1.81 | 1.22 | 1.745 | 1.04 |
| Back (dot) | 224 | 152 | 144 | 176 | 96 | 248 |
| (uS) | 3.91 | 2.70 | 1.92 | 2.23 | 1.745 | 2.30 |
| Total (H) | 667 | 631 | 806 | 800 | 530 | 1066 |
| (mS) | 13.413 | 11.756 | 14.272 | 13.328 | 8.325 | 16.661 |
| Disp (H) | 624 | 600 | 768 | 768 | 480 | 1024 |
| (mS) | 12.548 | 11.179 | 13.599 | 12.795 | 7.540 | 16.005 |
| Front (H) | 1 | 1 | 3 | 1 | 8 | 1 |
| (mS) | 0.020 | 0.019 | 0.053 | 0.017 | 0.126 | 0.016 |
| Sync Pulse (H) | 3 | 3 | 6 | 3 | 6 | 3 |
| (mS) | 0.060 | 0.056 | 0.106 | 0.050 | 0.094 | 0.047 |
| Back (H) | 39 | 27 | 29 | 28 | 36 | 38 |
| (mS) | 0.784 | 0.503 | 0.513 | 0.466 | 0.566 | 0.594 |
| Interlace | NON | NON | NON | NON | NON | NON |
| Polarity (H/V) | NEG/NEG | POS/POS | NEG/NEG | POS/POS | NEG/NEG | POS/POS |
| Composite Sync | NEG | | | | | |
| Composite Video | | | | | | |
| Character Font | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 | 7*9 |
| Serration | ON | OFF | OFF | OFF | OFF | OFF |
| EQP | OFF | OFF | OFF | OFF | OFF | OFF |



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| Preset Mode No. | 19 | 20 | | | | |
|---|---|---|---|---|---|---|
| Signal Name | 800*600<br>(100) | 1024*768<br>(85) | | | | |
| Resolution | 800*600 | 1024*768 | | | | |
| Dot Clock (MHz) | 67.50 | 94.5 | | | | |
| fh (kHz) | 63.92 | 68.677 | | | | |
| fv (Hz) | 100.03 | 85 | | | | |
| Total (dot) | 1056 | 1376 | | | | |
| (uS) | 15.64 | 14.561 | | | | |
| Disp (dot) | 800 | 1024 | | | | |
| (uS) | 11.852 | 10.836 | | | | |
| Front (dot) | 40 | 48 | | | | |
| (uS) | 0.593 | 0.508 | | | | |
| Sync Pulse (dot) | 80 | 96 | | | | |
| (uS) | 1.185 | 1.016 | | | | |
| Back (dot) | 136 | 208 | | | | |
| (uS) | 2.015 | 2.201 | | | | |
| Total (H) | 639 | 808 | | | | |
| (mS) | 9.997 | 11.765 | | | | |
| Disp (H) | 600 | 768 | | | | |
| (mS) | 9.386 | 11.183 | | | | |
| Front (H) | 3 | 1 | | | | |
| (mS) | 0.047 | 0.015 | | | | |
| Sync Pulse (H) | 4 | 3 | | | | |
| (mS) | 0.063 | 0.044 | | | | |
| Back (H) | 32 | 36 | | | | |
| (mS) | 0.501 | 0.524 | | | | |
| Interlace | NON | NON | | | | |
| Polarity (H/V) | POS/POS | POS/POS | | | | |
| Composite Sync | | | | | | |
| Composite Video | | | | | | |
| Character Font | 7*9 | 7*9 | | | | |
| Serration | OFF | OFF | | | | |
| EQP | OFF | OFF | | | | |



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## Distortion Adjustment

Factory Mode Setting

*After completion of adjustment exit the factory mode and data will be saved.

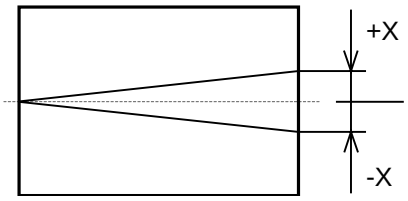
Signal : All signals  Cross hatch

Perform the adjust for signal No. 14 in step 6-1~3.

Perform the adjust for above all signal in step 6-4,5.

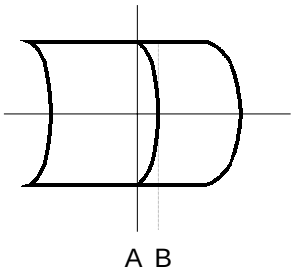
1. Picture Tilt Adjustment
   (1) Receive signal 14 (Cross hatch).
   (2) When OSM MENU is displayed, Select the “ “ icon.
   (3) Make sure that the picture tilt meets the following standards.

X ≦ ± 1.0mm

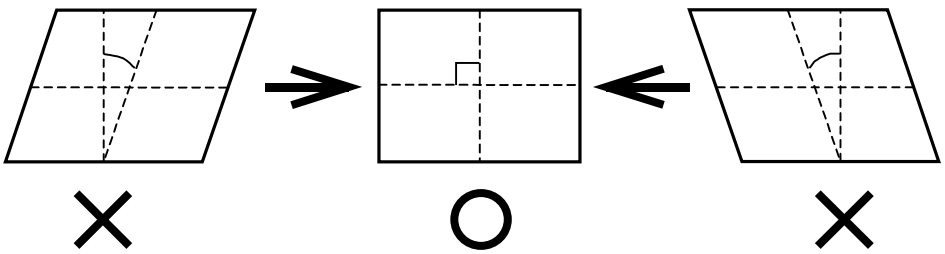



2. Pincushion Balance Adjustment
   (1) When OSM MENU is displayed, Select the “ “ icon.
   (2) Make sure that the Pincushion Balance meets the following standards.

A – B ≤ 0.5mm




3. Parallelogram distortion Adjustment
   (1) When OSM MENU is displayed, Select the “ “ icon.
   (2) Adjust “+”, “-“ SW so that the vertical line and horizontal line at the screen’s center fall at right angles. (less than 90 ± 0.5 degree)





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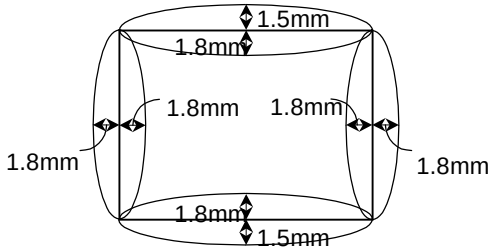
4. Side Pincushion Adjustment

(1) When OSM MENU is displayed, Select the “ ” icon.

(2) Make sure that the side pincushion distortion meets the following standards.




5. Trapezoid Distortion Adjustment

(1) When OSM MENU is displayed, Select the “ ” icon.

(2) Make sure that the trapezoid distortion meets the following standards.

$|(AB-CD)| \leq 2mm$

$|(AC-BD)| \leq 2mm$

6. Preset Picture Size and Position Adjustment

Factory Mode Setting

Signal: All Signals Cross hatch

*Perform the Preset Picture Size and Position Adjustment for above all signal.

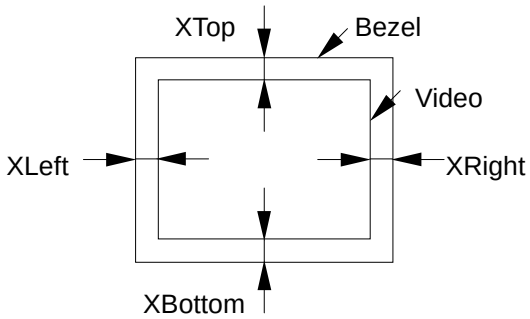
(1) When OSM MENU is displayed, Select the “ ”,” ”,” ”,” ” icon.

(2) Adjust the picture size and position as listed below by “–”, “+” SW.

Picture size

H : 310 ± 2mm

V : 232 ± 2mm




Picture position

H : $|(X_{TOP}–X_{BOTTOM})| \leq 3mm$

V : $|(X_{LEFT}–X_{RIGHT})| \leq 3mm$



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7. Purity

(1) Receive signal 14(Cross hatch pattern).

(2) The CRT face should be facing east and degauss the entire unit by external degaussing coil.

(3) Make sure the single color purity.

If not, readjust CPC magnet and touch up using correction magnets.

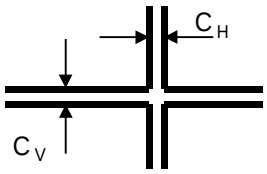
8. Convergence

$C_H$ : Convergence error of horizontal direction

$C_V$ : Convergence error of vertical direction

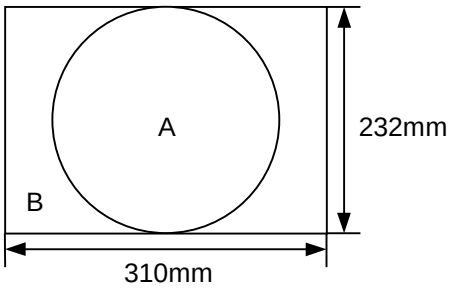
$C_S$ : Total direction of Convergence error

(Calculate by "$\sqrt{C_H^2 + C_V^2}$ "




(1) Receive signal 14(Cross hatch pattern).

(2) Measure convergence error., If it is out of spec, adjust static convergence by 4-pole magnets and 6-pole magnets.




A Zone (A circle 232 mm in the center of the CRT face center)

$C_H$, $C_V$: Within 0.35 mm

$C_S$: No rule

B Zone (Areas outside of zone A within the rectangle of 310 mm×232 mm)

Safety with the list below.

| | $C_H \leqq 0.35$ mm | $0.35 \text{ mm} < C_H < 0.40$ mm |
|---|---|---|
| $C_V \leqq 0.35$ mm | OK | Calculate $C_S$ and judge Within 0.50 mm $\rightarrow$ OK |
| $0.35 \text{ mm} < C_V < 0.40$ mm | Calculate $C_S$ and judge Within 0.50 mm $\rightarrow$ OK | Need to touch up |



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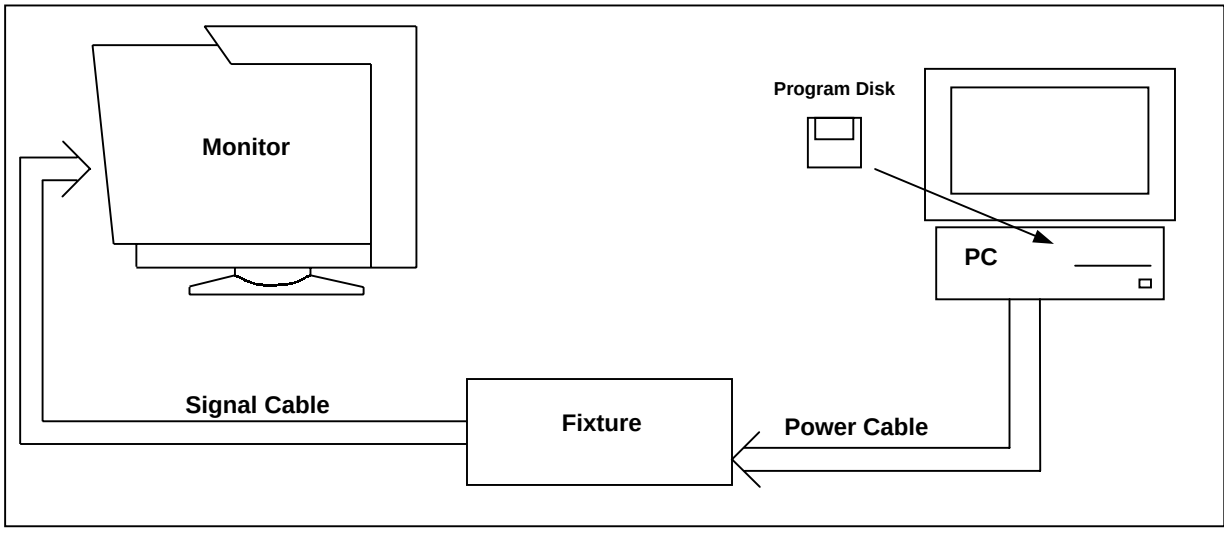
## Write and Inspection for Plug and Play Communication

1. Construction of System

This system should be connected as shown below.




Note: PC clock speed should be below 266MHz. OS is PC-DOS.
Fixture Board can be connected directly to PC without Printer Cable.

2. EDID Write and Inspection Method

1) Run specified EDID write and Inspection program on PC-DOS mode.
The monitor turns into the self test mode.

2) Run the specified EDID write and inspection program under PC-DOS mode.

3) Key in the serial No. or Scan serial No. bar code.

4) Press “Return” key to write the EDID data.

5) Press “F1” key to inspect DDC1 communication.

6) Press “F2” key to inspect DDC2 communication
EDID DATA Format: Please refer the 3. EDID data File.



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3. EDID DATA FILE

(1) EDID Serial No. Format

MultiSync 75F  Week of Manufacture (Month*4)

Year of Manufacture

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 38 | A3 | D1 | 5D | 01 | 01 | 01 | 01 |
| 10 | 0A | 0A | 01 | 03 | 0C | 21 | 18 | 78 | EA | 57 | 98 | A4 | 52 | 46 | 97 | 24 |
| 20 | 11 | 48 | 4C | FF | EE | 00 | 31 | 59 | 45 | 59 | 61 | 59 | 71 | 4A | 81 | 40 |
| 30 | 01 | 01 | 01 | 01 | 01 | 01 | EA | 24 | 00 | 60 | 41 | 00 | 28 | 30 | 30 | 60 |
| 40 | 13 | 00 | 36 | E8 | 10 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 37 | 78 | 1F |
| 50 | 46 | 0B | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | 00 | 00 | 00 | FC | 00 | 4D |
| 60 | 75 | 6C | 74 | 69 | 53 | 79 | 6E | 63 | 20 | 37 | 35 | 46 | 00 | 00 | 00 | FF |
| 70 | 00 | 30 | 33 | 30 | 30 | 30 | 30 | 31 | 59 | 41 | 0A | 20 | 20 | 20 | 00 | B5 |

Serial No Area 9bytes  Check Sum

AccuSync 75F  Week of Manufacture (Month*4)

Year of Manufacture

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 00 | FF | FF | FF | FF | FF | FF | 00 | 38 | A3 | D1 | 5D | 01 | 01 | 01 | 01 |
| 10 | 0A | 0A | 01 | 03 | 0C | 21 | 18 | 78 | EA | 57 | 98 | A4 | 52 | 46 | 97 | 24 |
| 20 | 11 | 48 | 4C | FF | EE | 00 | 31 | 59 | 45 | 59 | 61 | 59 | 71 | 4A | 81 | 40 |
| 30 | 01 | 01 | 01 | 01 | 01 | 01 | EA | 24 | 00 | 60 | 41 | 00 | 28 | 30 | 30 | 60 |
| 40 | 13 | 00 | 36 | E8 | 10 | 00 | 00 | 1E | 00 | 00 | 00 | FD | 00 | 37 | 78 | 1F |
| 50 | 46 | 0B | 00 | 0A | 20 | 20 | 20 | 20 | 20 | 20 | 00 | 00 | 00 | FC | 00 | 4D |
| 60 | 75 | 6C | 74 | 69 | 53 | 79 | 6E | 63 | 20 | 37 | 35 | 46 | 00 | 00 | 00 | FF |
| 70 | 00 | 30 | 33 | 30 | 30 | 30 | 30 | 31 | 59 | 41 | 0A | 20 | 20 | 20 | 00 | B5 |

Serial No Area 9bytes  Check Sum

(2) Bar Code Format(code39)

MS75F

| Digit | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Format | * | N | N | N | N | N | N | N | N | | | _ | Y | M | S | S | S | S | S | F | R | * |
| Example | * | N | B | 7 | 0 | 2 | 1 | 5 | L | | | | 1 | X | 0 | 0 | 0 | 0 | 1 | Y | J | * |

*+Model Code + 3 spaces + Serial No. + *

AS75F

| Digit | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Format | * | N | N | N | N | N | N | N | N | _ | _ | _ | Y | M | S | S | S | S | S | F | R | * |
| Example | * | N | A | 7 | 0 | 2 | 1 | 6 | L | _ | _ | | 1 | X | 0 | 0 | 0 | 0 | 1 | Y | J | * |

*+Model Code + 3 spaces + Serial No. + *



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Serial No.  Descriptions:

Y: Manufactured Year (Last digit) ex. 1 → 2001

M: Manufactured Month 1 ~ 9, X(October),
Y(Novenber), Z(December)

S: Serial No. ( 5digits) 00001 ~ onward
(restart when month is changed)

F: Factory Code: Y is NPG China Factory

R: Product Revision code: start from J

EDID Code Input Procedure ex.

1) Scan Bar code (20 digits) NB70215L_ 1X00001YJ
2) Skip 11 digits then find the Serial No. 1X00001YJ
3) Make Year hex Code from Year digit 1 → 0Bh
4) Make Week hex Code from Month digit 10*4 = 40 → 28h
5) Change Serial No. to ASCII code 31h 58h 30h 30h 30h 30h 31h 59h 4Ah
6) Apply Serial No. Information to the default EDID code.
7) Download EDID from PC to Monitor.
8) DDC2B Inspection



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# TROUBLE SHOOTING

Refer to User’s Manual trouble shooting section before using this chart.

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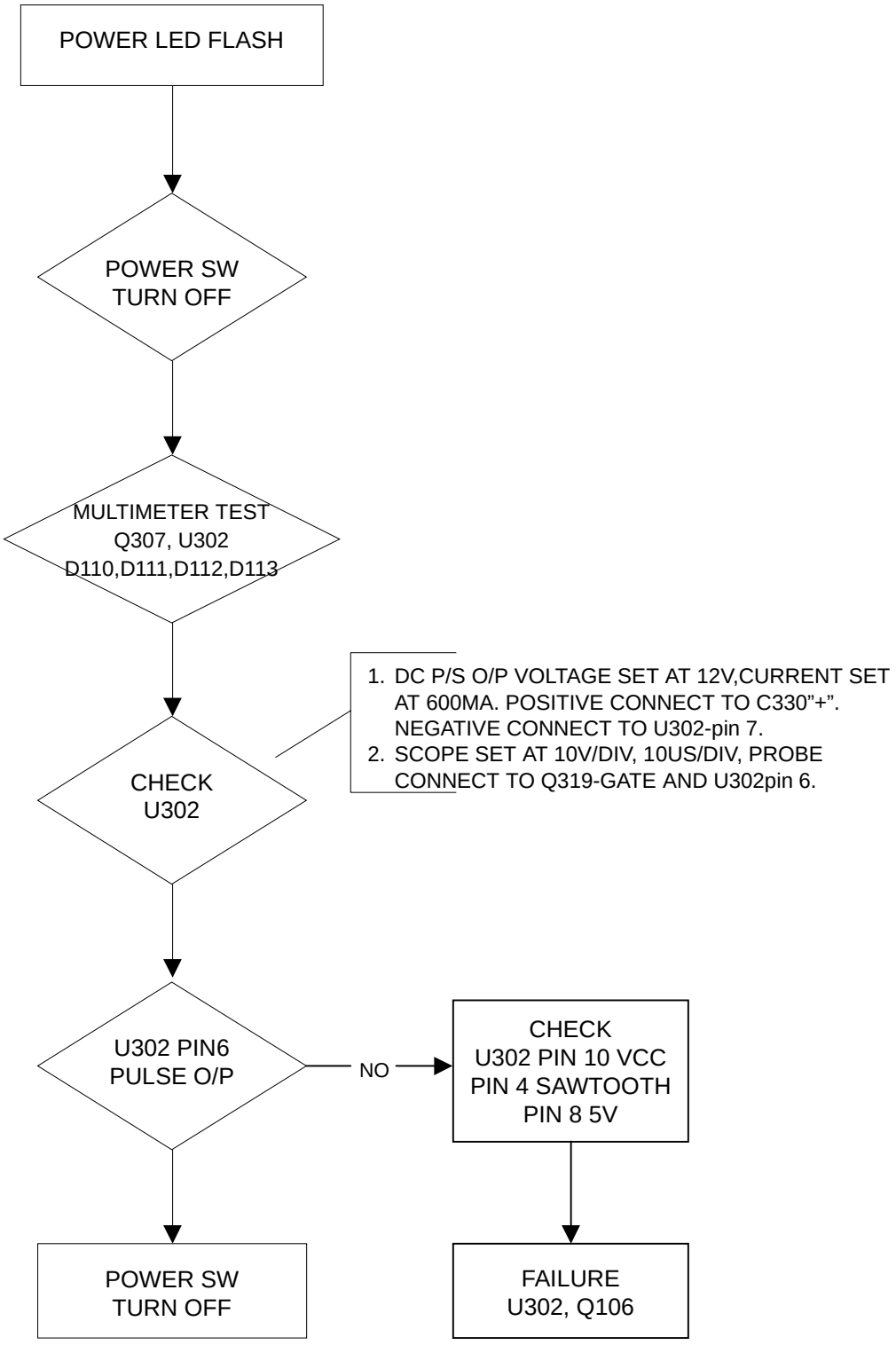
1. NO OPERATION, POWER LED FLASH


POWER LED FLASH
POWER SW TURN OFF
MULTIMETER TEST Q307, U302 D110,D111,D112,D113
CHECK U302
1. DC P/S O/P VOLTAGE SET AT 12V,CURRENT SET AT 600MA. POSITIVE CONNECT TO C330"+". NEGATIVE CONNECT TO U302-pin 7.
2. SCOPE SET AT 10V/DIV, 10US/DIV, PROBE CONNECT TO Q319-GATE AND U302pin 6.
U302 PIN6 PULSE O/P
NO
CHECK U302 PIN 10 VCC PIN 4 SAWTOOTH PIN 8 5V
POWER SW TURN OFF
FAILURE U302, Q106



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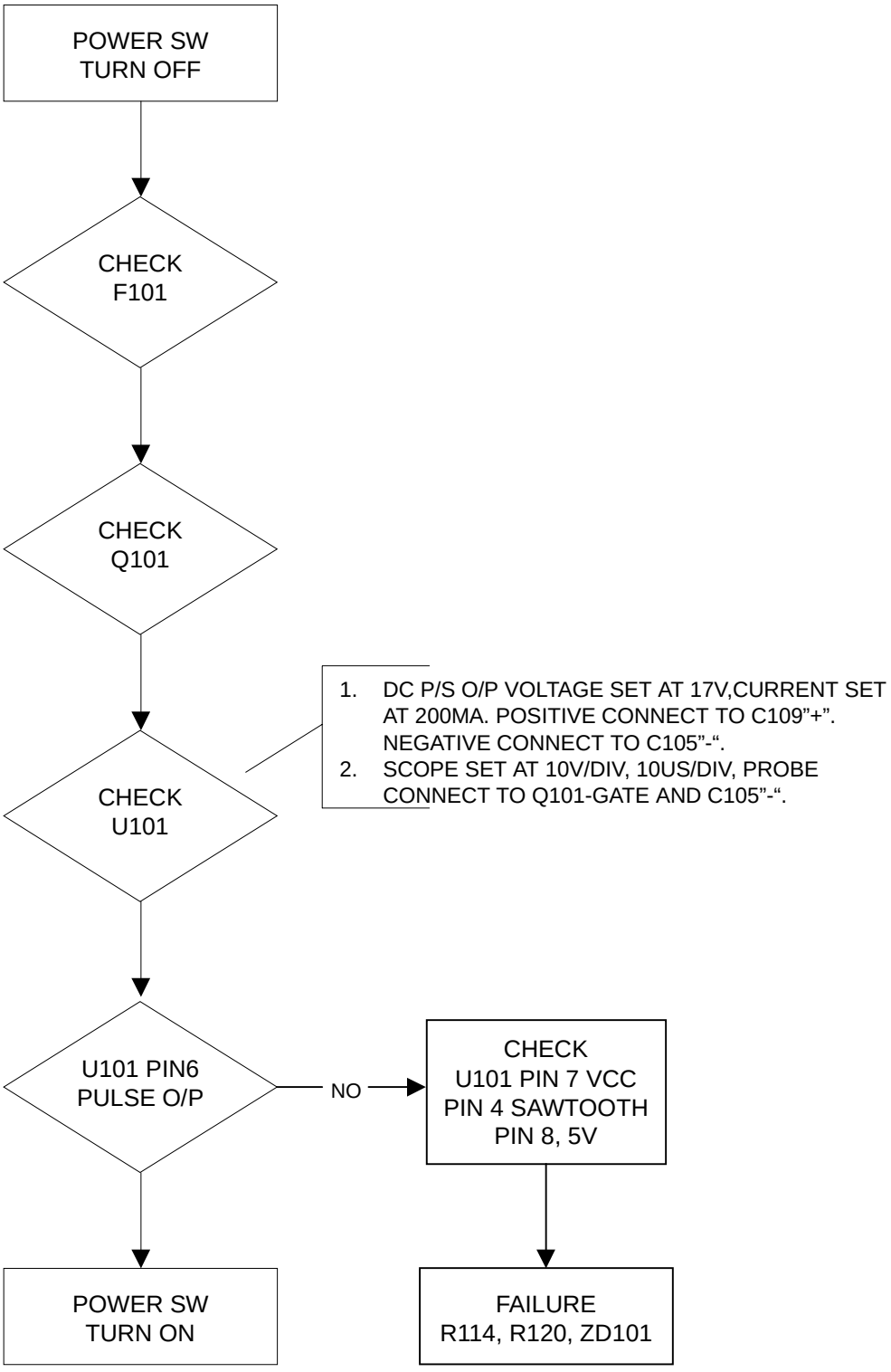
2. NO OPERATION, POWER LED OFF



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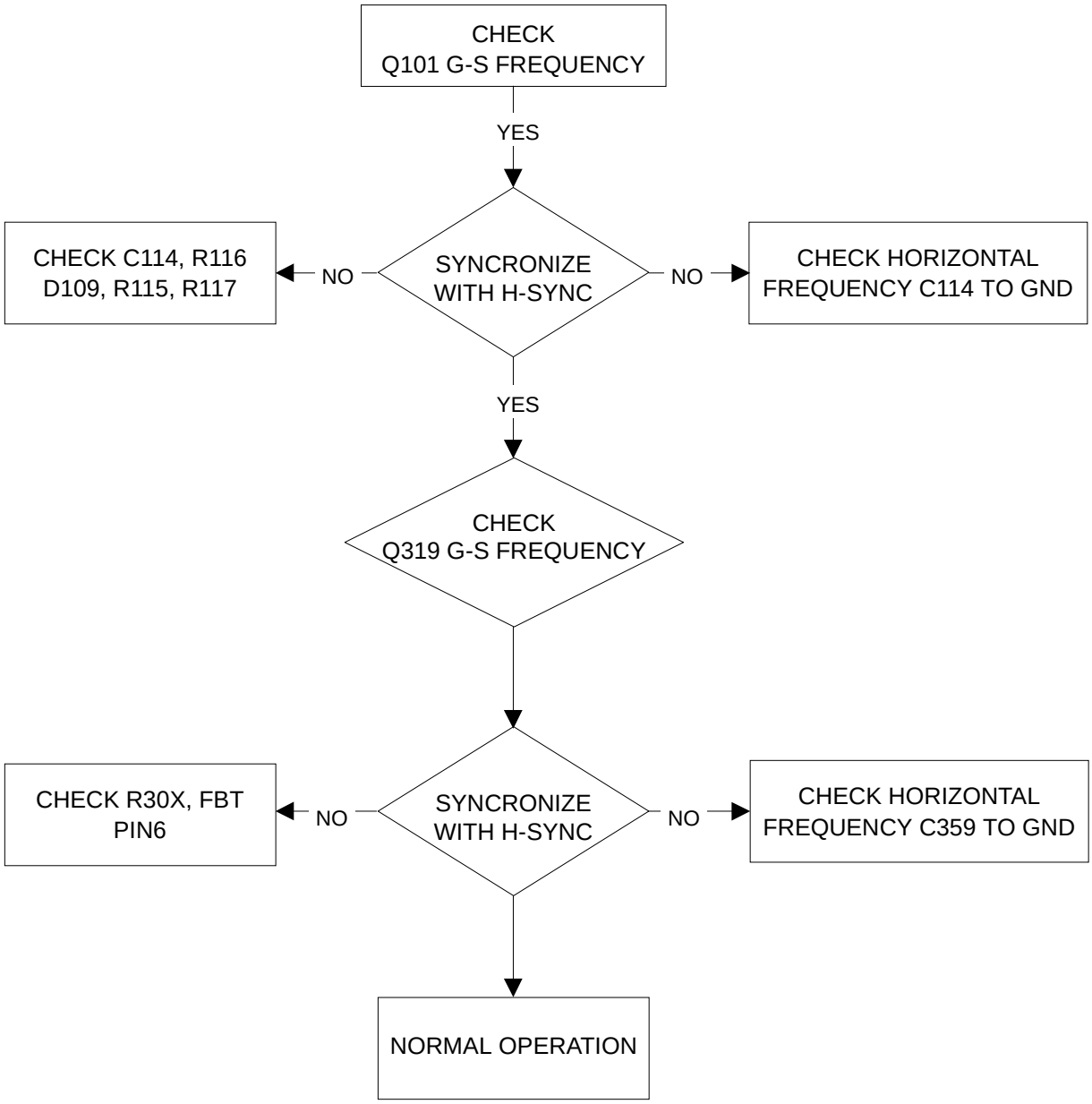
3. VIDEO NOISE, UNSYNCHRONOUS



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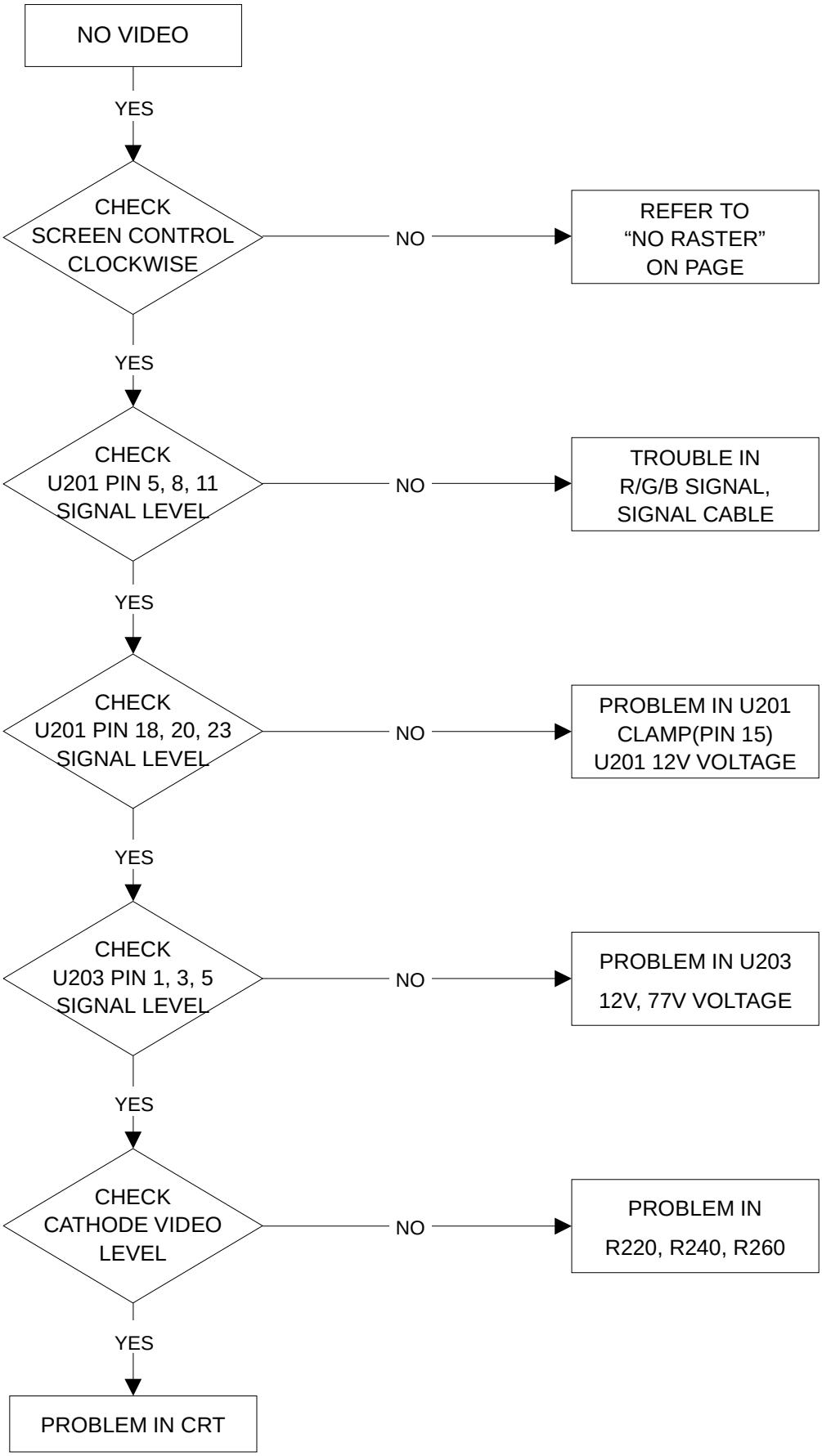
4. NO VIDEO



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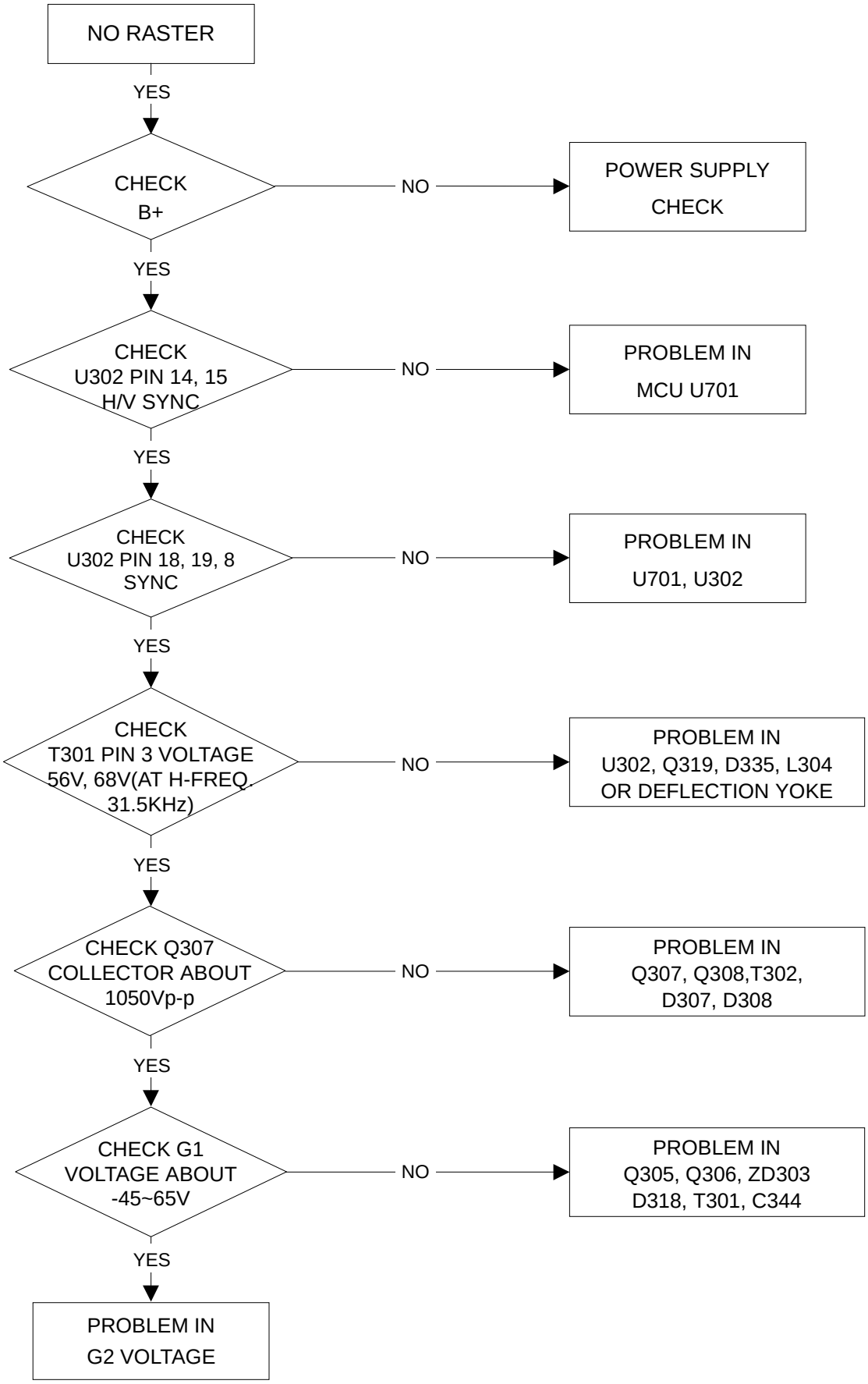
5. NO RASTER



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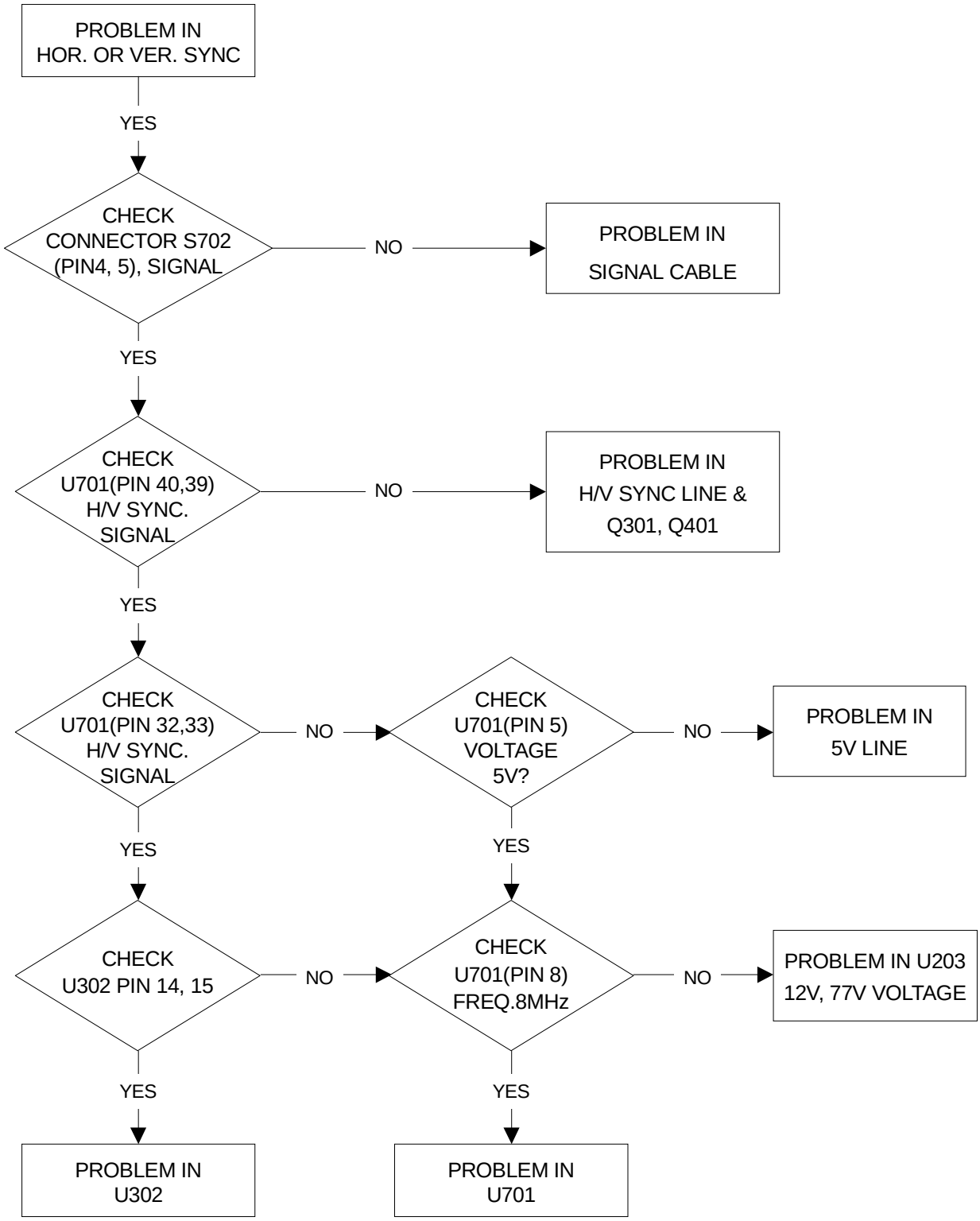
6. TROUBLE IN H. V SYNC



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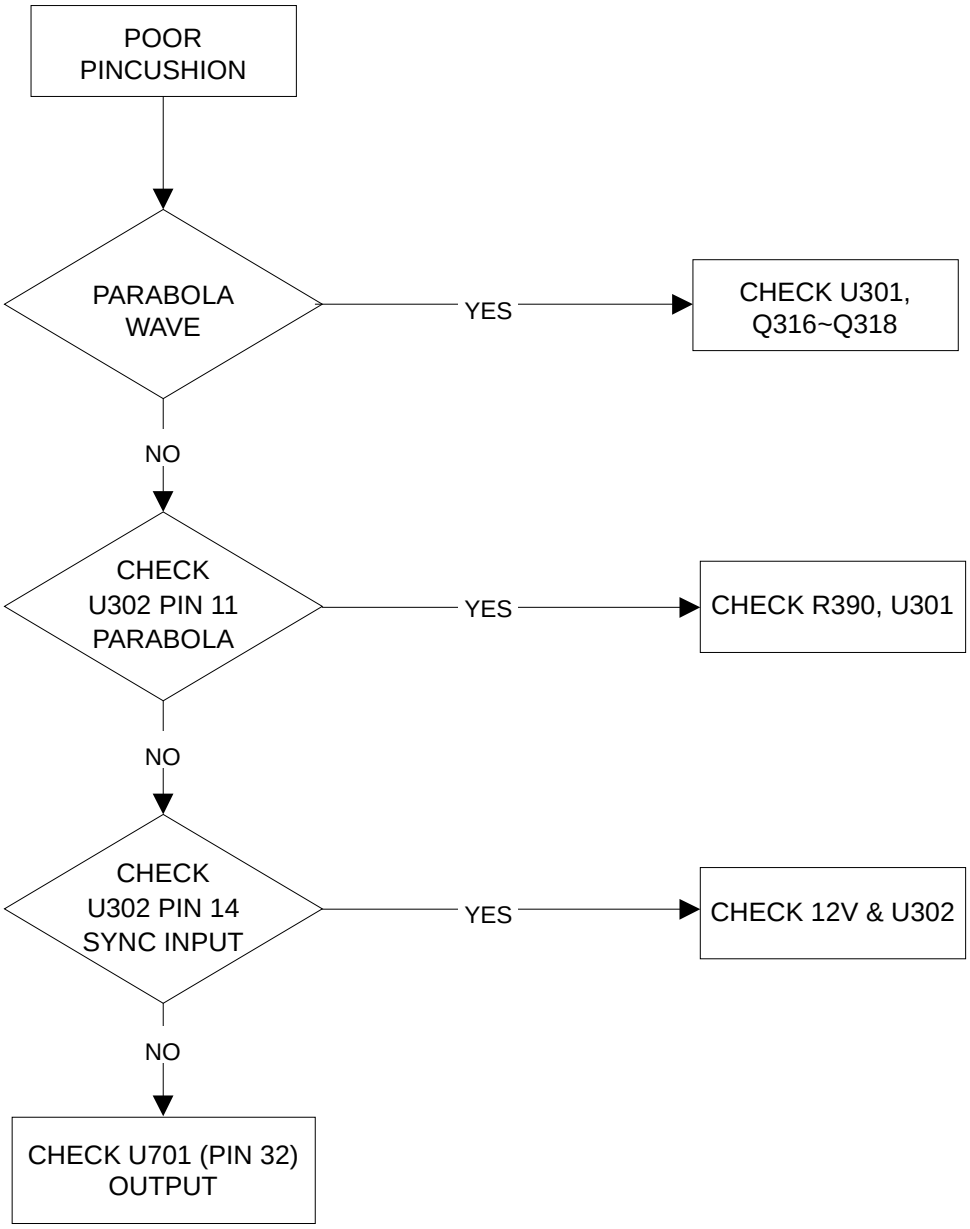
7. POOR PINCUSHION



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# CIRCUIT DESCRIPTION

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1. Power supply circuit

① Outline

This power supply unit adopts the switching mode technology, and is an off-line mode type unit that provided several different DC outputs. The scanning frequency is available in different values ranging from 31 kHz to 69 kHz. Moreover, it is capable to operate at an AC input voltage of 100V ~ 240V and an AC frequency of 50-60 Hz±3Hz.

The block diagram is the functional construction schematics, that shows the major functions of this power supply unit.

② Harmonics (OPTION)

L107 is a harmonic choke circuit that reduces the harmonic peak currents, for the purpose of fulfilling the requirement items of IEC 1000-3-2.

③ EMI

The EMI circuit has a 2-stage construction, with the first stage consisting of the common mode choke unit and one X-capacitor, and the second stage consisting of the common mode choke unit and four Y-capacitors.

R101 is the bleed resistor of the X-capacitor. When the power supply switch is turned OFF, this resistor carries out the emergency charging of the capacitor C101.

The EMI is the circuit that prevents the monitor switching noise from being generated, there by minimizing the negative influence on the other electronic equipment.

④ AC rectifier and smoothing capacitor

The AC input is rectified by means of the full-bridge rectifier, that consists of the diodes D101 to D104. The AC voltage is converted into the DC voltage by passing through the next stage, that consists of the smoothing capacitor C105.

TH101 is a NTC thermistor for the power supply at the in-rush current limit.

⑤ Degaussing circuit

The degaussing circuit consists of the PTC thermistor TH102, the degaussing coil and the relay RL101. The relay is controlled by means of the +12V control signal coming from the CPU.

⑥ Transformer and energy induction

1) When the PWM controls IC KA3842A chip, a driving pulse is generated at the gate of the transistor Q101, and Q101 turns ON. The current returns from the “plus” (+) side of the energy-supplying capacitor C105 to the “minus” (-) side of the same capacitor C105, passing through the transformer Q101 D-S. During the ON cycle, the energy is stored in the transformer T101. The transistor Q101 turns OFF when the driving pulse disappears from Q101. As a result, all voltages of the dot ends of the winding flow to the positive direction and reach the fly-back rectifier. At that point of time, the diodes of the rectifier of the secondary side turn ON, a temporary energy is induced at the secondary side, and the ON cycle of the driving pulse is repeated.



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2) The power supply MOS FET Q101 carries out the ON/OFF operation of the control unit, by means of U101 KA3842A. KA3842A is a PWM (pulse width modulation) IC chip, with 16 V starting voltage and 10 V cut-off voltage.

The following list shows the pin layout of KA3842A pulse width modulation IC chip.

| | | | |
|---|---|---|---|
| Pin 1: | Feedback | Pin 2: | Compensation |
| Pin 3: | Current sensor | Pin 4: | Oscillator |
| Pin 5: | Ground (GND) | Pin 6: | Pulse output |
| Pin 7: | VCC | Pin 8: | VREF (5.1 V) |

3) Overcurrent protection

R111 is a sensor resistor, and it has the function of increasing the current of this loop when the output of the secondary side is either in the overloaded state or is insufficient.

Since the current passing through the R111 sensor resistor has voltage dropping effect, the operation of the output pulse is stopped when a voltage lower than 1 Volt is detected at the pin number 3 of the KA3842A 3chip, and the switch of the power supply MOS FET is kept in the “break” state until the VCC voltage is charged up to 16 Volts, and the operation of U101 KA3842A is resumed. When it is not clearly known whether there is voltage shortage or not, however, this circuit repeats the ON/OFF switching, and the power supply LED lights up.

4) Starting circuit

The resistor R122 and R123 and the transistor U103 and diode D131 and resistor R169 and zener diode ZD101 are for the starting operation. When the circuit starts its operation, the power supply transformer T101 supplies the auxiliary 12 Volt power to the control IC chip U101 via pins 6 and 7 of the winding transformer T101.

5) Synchronization circuit

The synchronization signal is induced from the fly-back transformer (FBT), and carries out the synchronization with the power supply frequency. The frequency range is from 31 kHz to 70 kHz, and the component elements of the synchronization circuit are C114, R116, D109, R115 and R117.

6) Feedback circuit

The feedback circuit loop induces the 12 V voltage through the pin 6 and the pin 7 of the power supply transformer. That voltage is connected with the pin 3 of the IC chip U101 by passing through U103, R122, R123 and passing next through R10A, VR101 and R151. This is a regular loop.

7) Snubber circuit

The snubber circuit has the function of clamping the ON/OFF spikes of the power supply MOS-FET, and its component elements D105, C106, R106 make up a snubber that turns OFF the power supply MOS-FET.

8) Secondary rectifier and smoothing rectifier

The secondary rectifier is a harmonic rectifier consisting of D111, C124 and R128, and it works as a snubber circuit as well. The capacitors C120 and C138 are the smoothing rectifier working on the 49 Volt DC output. There are also other DC outputs, such as 80 Volt (D110), 13.5 Volt (D112) and 6.3 Volt (D113).



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⑦ Power saving

Suspend mode : Every DC voltage operation of the CRT is turned OFF.
The color of the power LED101 switches from green to orange.

OFF mode : This is the mode in which the CPU control unit turns OFF the power supply, but the power turns ON when the user touches the keyboard.
The power LED switches to dark orange color.

1) When the power switch is turned ON when there is nothing being entered in the video cable. At that time, if the video is shifted from the free-run mode to the suspend mode, the transistor Q107 turns OFF and the operation returns to the OFF mode within a few seconds.
2) As for the sequence of steps that turn the operation to the OFF mode, if the keyboard is not touched for a given period of time that a preset in advance, the CPU outputs the LOW level signal to the transistor Q107, then Q105 turns OFF, the transistor Q108 and Q104 turns OFF. As a result the power is shut out at that state.
3) When the user touches the keyboard in the OFF mode, the operation is resumed, the video signals V-SYNC and H-SYNC turn ON the CPU via resistor R129 and R159, then the transistor Q105 and Q107 turn ON, the transistors Q104 and Q108 turn ON. As a result the operation returns to the ON state.

⑧ DC/DC

The DC/DC voltage is DC 49 volts, and since the set-up voltage is variable from 62 volts to 160 volts, it is variable depending on the horizontal synchronism. The frequency band is variable from 31 kHz to 69 kHz. The voltage is fed back from the fly-back transformer (FBT). The DC/DC output voltage is used as high-voltage input of FBT T301.

1) DC/DC is a step-up circuit, and consists mainly of the choke L304, the transistor Q319, the diode D335 and U302.
2) When the PWM controls U302 IC TDA4857, a driving pulse is generated at the gate of the transistor Q319, and the transistor Q319 turns ON. During the ON cycle, the energy is stored in the choke L304. The transistor Q319 turns OFF when the driving pulse disappears from the gate of the transistor Q319. As a result, the voltage at the dot terminal of the winding flows in the positive direction and goes to the fly-back rectifier. The energy stored in the choke L304 is entered in the FBT, passing through the choke L304, the diode D335 and the capacitor C307.
3) The feedback is detected by the FBT via diode D310, the capacitor C326, the resistor R349 the variable resistor VR302 and the fixed resistor R382, and is connected to the U302 pin 5.
This is loop is the regular type one.
4) The frequency of the synchronization signal coming from video H-SYNC is variable from 31 kHz to 69 kHz. The circuit consists of the R30X.
5) The soft start circuit consists of the resistor R30P, the capacitor C309, the diode D303 and the Q326.



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2. MCU

## Monitor MCU Specification

Frequency Specification

H-freq. : 29.5K – 70KHz

V-freq. : 43 – 160Hz

Judge polarity only when frequency is 31.5 KHz and 37.8 KHz

Support composite sync detection

System Architecture

1. MCU – Weltrend WT6232, 32K bytes ROM size
2. EEPROM – 24C08 series, 8K bit, with ID code for identify initialization.
3. OSD – Myson MTV016N-12

Input

1. Sync input – 2 pins for H-sync & V-sync frequency inverted input.
2. Key input – 2 pins for A/D key input (SELECT. UP, DOWN and RECALL).
3. Burn-in ID input – 1 pins for Burn-in ID input.
4. Reset input – low pulse for reset MCU
5. Crystal input – 2 pins using 8MHz crystal.

Output – MCU digital pin

1. Degauss – Active high pulse for 2.5 sec when in degauss. MCU will activate degauss while power on.
2. CS output – 3 pins (CS2, CS1, CS0) for CS control

| H-sync | CS2 | CS1 | CS0 |
|---|---|---|---|
| H-sync < 33.25KHz | 0 | 0 | 0 |
| 33.25KHz<H-sync<36.50KHz | 0 | 1 | 0 |
| 36.50KHz<H-sync<40.50KHz | 0 | 1 | 1 |
| 40.50KHz<H-sync<45.10KHz | 1 | 0 | 0 |
| 45.10KHz<H-sync<51.60KHz | 1 | 0 | 1 |
| 51.60KHz<H-sync<55.10KHz | 1 | 1 | 0 |
| 55.10KHz<H-sync<62.15KHz | 1 | 1 | 0 |
| 62.15KHz<H-sync | 1 | 1 | 1 |
| Mode change | 0 | 0 | 0 |



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3. Power saving – 2 pins (PMUS, PMUO) for power saving control

– if Hf > 70KHz or Hf < 23KHz, enter power saving mode (suspend).

– enter power saving mode after 3 sec when condition met.

– enter suspend mode first for 3 sec before enter off mode if off mode condition met.

| Mode | H-sync freq. | V-sync freq. | Burn-in ID | PMUS | PMUO |
|---|---|---|---|---|---|
| Normal | Yes | Yes | --- | 1 | 1 |
| Stand By | No | Yes | --- | 0 | 1 |
| Suspend | Yes | No | --- | 0 | 1 |
| Off | No | No | Low | 0 | 0 |
| Burn-in | No | No | High | 1 | 1 |

4. Mute – 2 pins for screen mute

Mute1 – active low pulse for about 0.6 sec when mode change.

Mute2 – active low pulse for about 1.0 sec when mode change, active with mute 1 simultaneously.

5. D/A – 14 pins (PWM output) are Brightness, Contrast, H-phase, H-size, V-center, V-size, Pincushion, Trapezoid, Rotation, Parallel, Pin-balance, R-gain, G-gain and B-gain.

– DAC value 255 means the maximum output volts except Parallel PWM.

– All D/A except Rotation, Brightness, Contrast, R-gain G-gain B-gain are mode dependent functions.

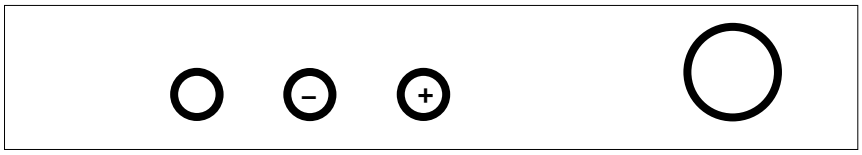
– Parallel is voltage inverter function.

6. Sync output – 2 pins for H-sync and V-sync negative output, normal high.
7. DDC – 2 pins (DDC SDA/DDC SCL) for DDC1/DDC2B or auto alignment control.

– In auto alignment mode, all keys and OSD are disabled.

8. SDA/SCL – 2 pins for EEPROM and OSD control.
9. WP – 1 pin, high for EEPROM write protect.

Control Panel Operation




**SELECT (RESET)** **POWER**

1. Key arrangement – 3 keys for OSD control.
2. Hot key operation
   A. Factory Mode: SELECT Key + UP (+) Key if pressed when the power SW on.
   B. OSD Position Control Mode: DOWN (-) Key if pressed when the power SW on.
   C. Aging mode: Select key if pressed when the power SW on.



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IIC interface

1. DDC1/DDC2B – VESA DDC1/DDC2B is supported.
2. Auto alignment – I²C auto alignment protocol is supported.

**Timing Table**

Total 24 modes.

1. Factory mode – 20 modes‘*’ indicate do not care.

| Mode | Resolution | H-sync. | V-sync. | H polarity | V polarity |
|---|---|---|---|---|---|
| 1 | VGA 350 | 31.5KHz | 70Hz | + | - |
| 2 | VGA 400 | 31.5KHz | 70Hz | - | + |
| 3 | VGA 480 | 31.5KHz | 60Hz | - | - |
| 4 | MACII 35k | 35.0KHz | 66Hz | * | * |
| 5 | 800*600(56) | 35.2KHz | 56Hz | * | * |
| 6 | 8514A | 35.5KHz | 87Hz | * | * |
| 7 | 640*480(75) | 37.5KHz | 75Hz | * | * |
| 8 | EVGA 400 | 37.8KHz | 84Hz | - | + |
| 9 | 800*600(60) | 37.8KHz | 60Hz | * | * |
| 10 | 640*480(85) | 43.3KHz | 85Hz | * | * |
| 11 | 800*600(75) | 46.8KHz | 75Hz | * | * |
| 12 | 1024*768(60) | 48.3KHz | 60Hz | * | * |
| 13 | MACII 49k | 49.7KHz | 74Hz | * | * |
| 14 | 800*600(85) | 53.6KHz | 85Hz | * | * |
| 15 | 1024*768(70) | 56.4KHz | 70Hz | * | * |
| 16 | 1024*768(75) | 60.0KHz | 75Hz | * | * |
| 17 | 640*480(120) | 63.7KHz | 120Hz | * | * |
| 18 | 1280*1024(60) | 64.0KHz | 60Hz | * | * |
| 19 | 800*600(100) | 64.0KHz | 100Hz | * | * |
| 20 | 1024*768(85) | 68.6KHz | 85Hz | * | * |

‘*’ indicate do not care.

2. User mode – 4 modes

– FIFO replacement is applied.



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## GENERAL DESCRIPTION

The WT62P1 is a microcontroller for digital controlled monitor with Universal Serial Bus (USB) interface. It contains an 8-bit CPU, 32K bytes flash memory, 512 bytes RAM, 14 PWMs, parallel I/Os, SYNC signal processor, timer, DDC1/2B interface, master/slave I²C interface, low speed USB device module, 6-bit A/D converter and watch-dog timer.

## FEATURES

* 8-bit 6502 compatible CPU with 6MHz operating frequency
* 32768 bytes flash memory, 512 bytes SRAM
* 12MHz crystal oscillator
* 14 channels 8-bit PWM outputs
* Sync signal processor with H+V separation, H/V frequency counter, H/V polarity detection/control and clamp pulse output
* Six free-running sync signal outputs (Horizontal frequency up to 106kHz)
* Self-test pattern
* DDC1/2B supported
* Fast mode master/slave I²C interface (up to 400kHz)
* Embedded USB function with endpoint 0 and endpoint 1
* Built-in 3.3V regulator for USB tranceiver
* Watch-dog timer
* Maximum 28 programmable I/O pins
* One 8-bit programmable timer
* 6-bit A/D converter with 4 selectable inputs
* One external interrupt request input
* Low $V_{DD}$ reset

## ORDERING INFORMATION

| Package Type | Part Number |
|---|---|
| 42-pin PDIP | WT62P1-N42 |
| 42-pin Shrink PDIP | WT62P1-K42 |
| 40-pin PDIP | WT62P1-N40 |
| 28-pin skinny PDIP | WT62P1-N28 |
| 44-pin SOP | WT62P1-S44 |



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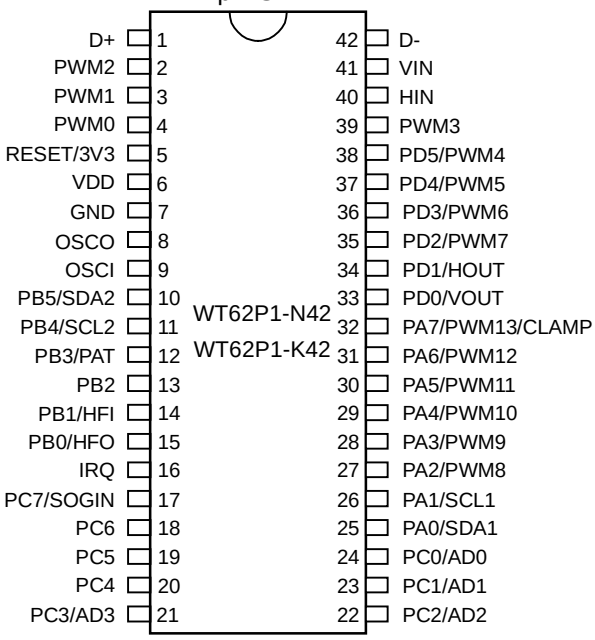
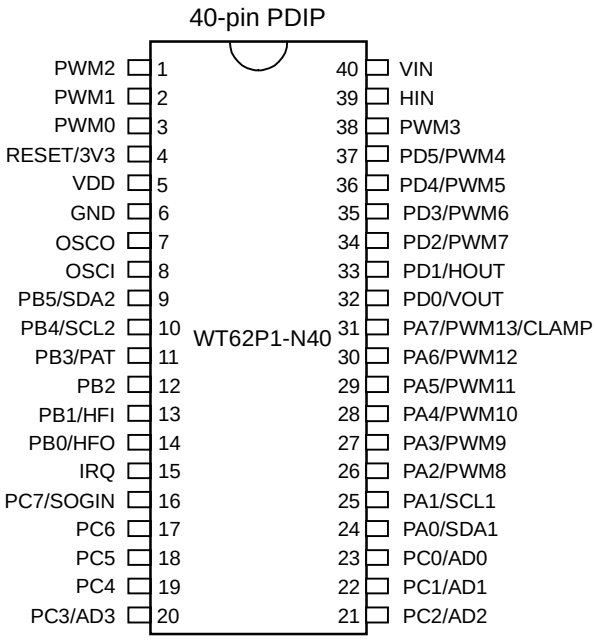
## PIN CONFIGURATION

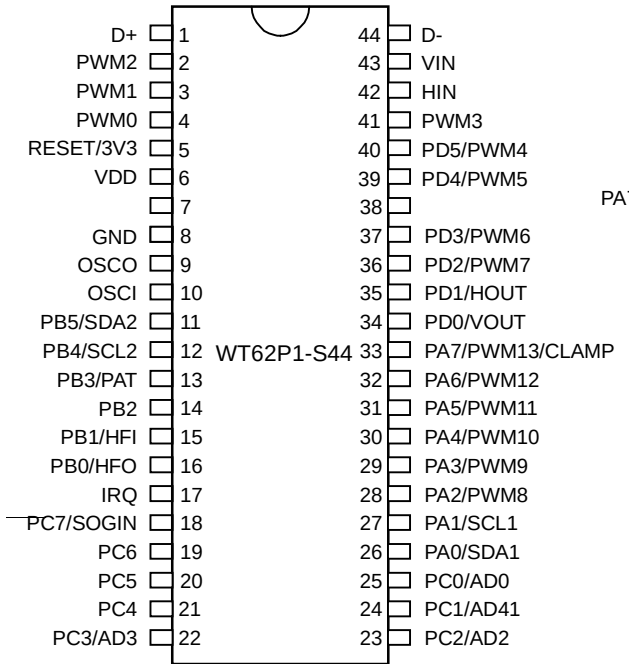
42-pin PDIP
42-pin SPDIP



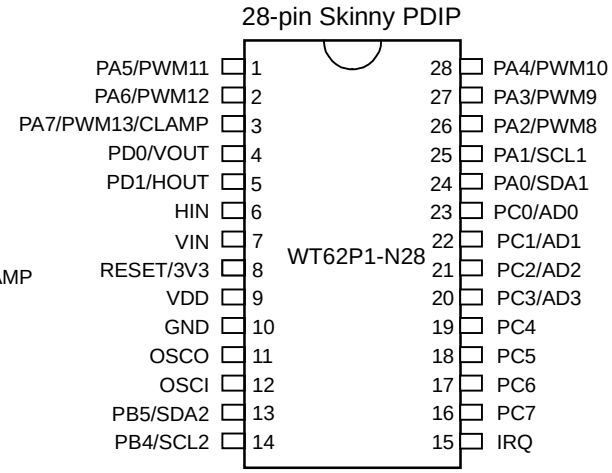

40-pin PDIP




44-pin SOP




28-pin Skinny PDIP



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## PIN DESCRIPTION

| Pin No. | | | | Pin Name | I/O | Descriptions |
|---|---|---|---|---|---|---|
| 40 | 42 | 40 | 28 | | | |
| 1 | 1 | - | - | D+ | O | USB D+ signal. |
| 2 | 2 | 1 | - | PWM2 | O | PWM2 output (10V open-drain). |
| 3 | 3 | 2 | - | PWM1 | O | PWM1 output (5V open-drain). |
| 4 | 4 | 3 | - | PWM0 | I | PWM0 output (5V open-drain). |
| 5 | 5 | 4 | 8 | /RESET/3V3 | | Reset input and +3.3V regulator output for USB tranceiver power supply. |
| 6 | 6 | 5 | 9 | VDD | | +5V power supply. |
| 7 | - | - | - | NC | O | No Connection. |
| 8 | 7 | 6 | 10 | GND | I | Ground. |
| 9 | 8 | 7 | 11 | OSCO | I/O | 12MHz oscillator output. |
| 10 | 9 | 8 | 12 | OSCI | I/O | 12MHz oscillator input. |
| 11 | 10 | 9 | 13 | PB5/SDA2 | I/O | Port B5 or I²C interface data line. |
| 12 | 11 | 10 | 14 | PB4/SCL2 | I/O | Port B4 or I²C interface clock line. |
| 13 | 12 | 11 | - | PB3/PAT | I/O | Port B3 or test pattern output. |
| 14 | 13 | 12 | - | PB2 | I/O | Port B2. |
| 15 | 14 | 13 | - | PB1/HFI | I/O | Port B1 or half frequency divider input. |
| 16 | 15 | 14 | - | PB0/HFO | I/O | Port B0 or half frequency divider output. |
| 17 | 16 | 15 | 15 | /IRQ | I/O | Interrupt request input, A low level on this can generate interrupt. |
| 18 | 17 | 16 | 16 | PC7/SOGIN | I/O | Port C7 or Sync on Green input. |
| 19 | 18 | 17 | 17 | PC6 | I/O | Port C6. |
| 20 | 19 | 18 | 18 | PC5 | I/O | Port C5. |
| 21 | 20 | 19 | 19 | PC4 | I/O | Port C4. |
| 22 | 21 | 20 | 20 | PC3/AD3 | I/O | Port C3 or ADC input 3. |
| 23 | 22 | 21 | 21 | PC2/AD2 | I/O | Port C2 or ADC input 2. |
| 24 | 23 | 22 | 22 | PC1/AD1 | I/O | Port C1 or ADC input 1. |
| 25 | 24 | 23 | 23 | PC0/AD0 | I/O | Port C0 or ADC input 0. |
| 26 | 25 | 24 | 24 | PA0/SDA1 | I/O | Port A0 or DDC interface SDA pin. |
| 27 | 26 | 25 | 25 | PA1/SCL1 | I/O | Port A1 or DDC interface SCL pin. |
| 28 | 27 | 26 | 26 | PA2/PWM8 | I/O | Port A2 or PWM8 output. |
| 29 | 28 | 27 | 27 | PA3/PWM9 | I/O | Port A3 or PWM9 output. |
| 30 | 29 | 28 | 28 | PA4/PWM10 | I/O | Port A4 or PWM10 output. |
| 31 | 30 | 29 | 1 | PA5/PWM11 | I/O | Port A5 or PWM11 output. |
| 32 | 31 | 30 | 2 | PA6/PWM12 | I/O | Port A6 or PWM12 output. |
| 33 | 32 | 31 | 3 | PA7/PWM13/ CLAMP | I/O | Port A7 or PWM13 output or clamp pulse output. |
| 34 | 33 | 32 | 4 | PD0/VOUT | O | Port D0 or Vsync output. |
| 35 | 34 | 33 | 5 | PD1/HOUT | O | Port D1 or Hsync output. |
| 36 | 35 | 34 | - | PD2/PWM7 | O | Port D2 or PWM7 output. |
| 37 | 36 | 35 | - | PD3/PWM6 | O | Port D3 or PWM6 output. |
| 38 | - | - | - | NC | O | No Connection. |
| 39 | 37 | 36 | - | PD4/PWM5 | I | Port D4 or PWM5 output. |
| 40 | 38 | 37 | - | PD5/PWM4 | I | Port D5 or PWM4 output. |
| 41 | 39 | 38 | - | PWM3 | | PWM3 output (10V open-drain) |
| 42 | 40 | 39 | 6 | HIN | | Hsync input. |
| 43 | 41 | 40 | 7 | VIN | | Vsync input. |
| 44 | 42 | - | - | D- | | USB D- signal |



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**FUNCTIONAL DESCRIPTION**

**CPU**

8-bit 6502 compatible CPU operates at 6MHz. Address bus is 16-bit and data bus is 8-bit.
The non-maskable interrupt (/NMI) of 6502 is modified to be maskable and is defined as INT0 with higher priority. The interrupt request (/IRQ) of 6501 is defined as INT1 with lower priority.

Please refer the 6502 reference menu for more detail.

**RAM**

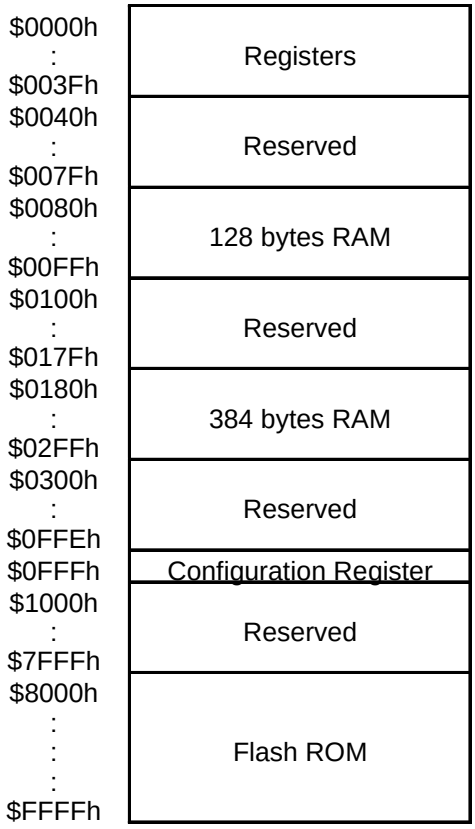
512 bytes RAM. Address is located from $0080h to $00FFh and $0180h to $02FFh.
RAM from $0200h to $027Fh and $0280h to $02FFh can be disabled individually to emulate different RAM size IC. (see Register $0FFFh)

ROM

32768 bytes flash memory for program. Address is located from $8000h to $FFFFh.

The following addresses are reserved for special purpose:

$FFFAh (low byte) and $FFFBh (high byte) : INT0 interrupt vector.
$FFFCh (low byte) and $FFFDh (high byte) : program reset interrupt vector.
$FFFEh (low byte) and $FFFFh (high byte) : INT1 interrupt vector.




System Reset

There are four reset sources of this controller. Fig. 1 shows the block diagram of reset logic.



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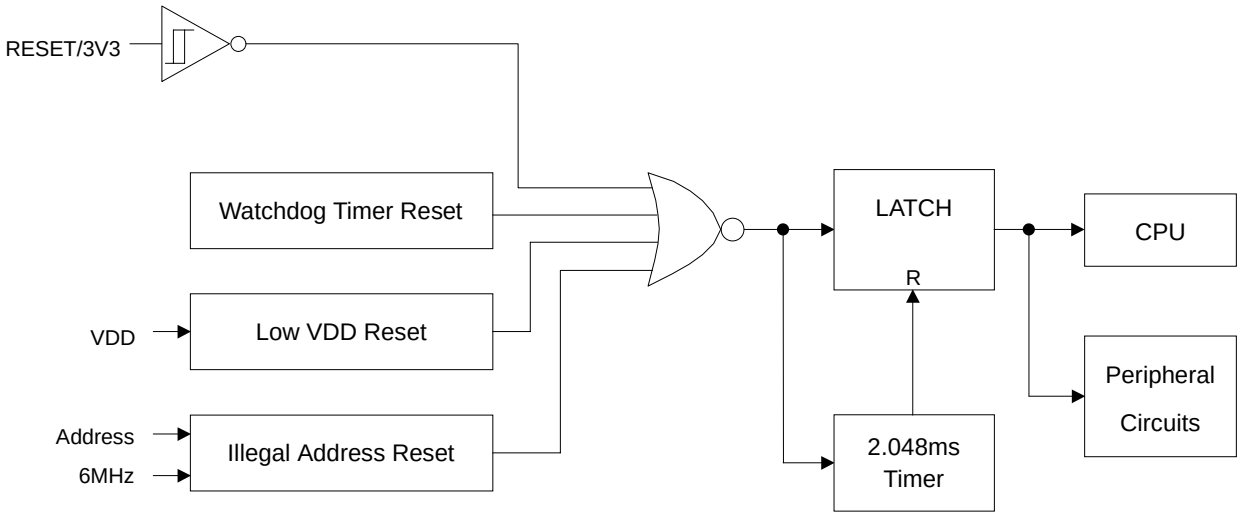


**Fig. 1 Reset Signals**

**External Reset**

A low level on the RESET/3.3V pin will generate reset.

**Illegal address Reset**

When the address bus of CPU goes to illegal address, a reset pulse will be generated.
The illegal address is defined as $0040h~$007Fh, $0300h~$0FFEh and $1000h~$7FFFh.

**Low VDD Voltage Reset**

When VDD is below 3.9V, an internal reset signal is generated. The reset signal will last 2.048 ms after the voltage is higher than 3.9V.

**Watchdog Timer Reset**

If a time-out happens when watchdog timer is enabled, a reset pulse is generated. Please refer watchdog timer section for more information.



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**I/O Port**

**I/O Port A**

Pin PA0 and PA1 are shared with DDC interface SDA1 and SCL1 When ENDDC bit is “0”, These two pins becomes I/O port. If PA0OE bit is set, Pin PA0 is an **open-drain** output. If PA0OE is cleared, Pin PA0 is an input pin with no internal pull-up resistor. The operation of PA1 is same as PA0. Fig. 2 Shows the structure of PA0.

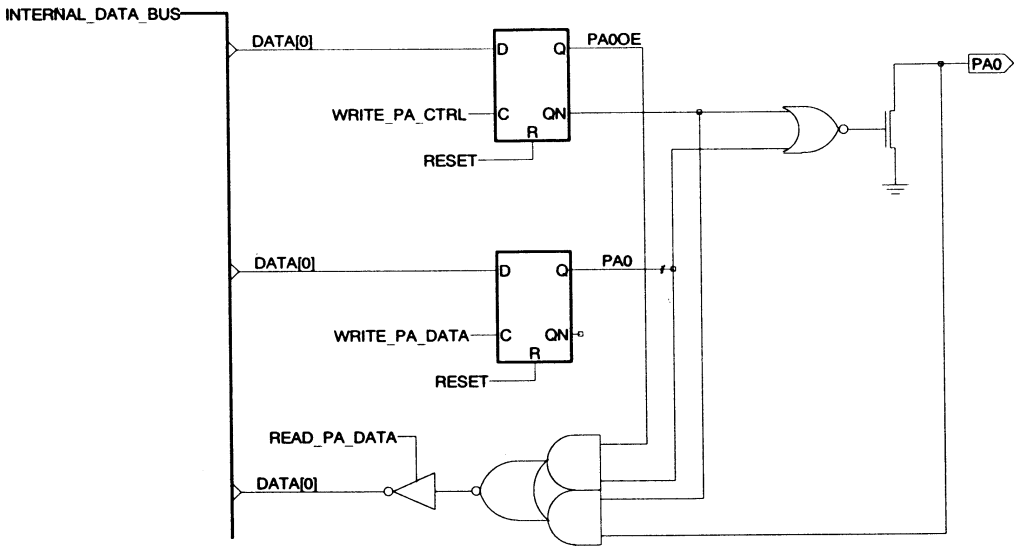


**Fig.2 Structure of PA0 and PA1**

Pin PA2 to PA6 are shared with PWM output. When corresponding EPWMx bit is “0”, the pin is I/O port. If PAxOE bit is set, it is a push-pull type output. If PAxOE bit is cleared, it is an input pin with internal pull-up resistor.

Pin PA7 is shared with PWM13 output and clamp pulse output. When both EPWM13 bit and ENCLP bit are “0”, this pin becomes I/O port. If PA7OE bit is set, it is a push-pull type output. If PA7OE bit is cleared, it is an input pin with internal pull-up resistor.

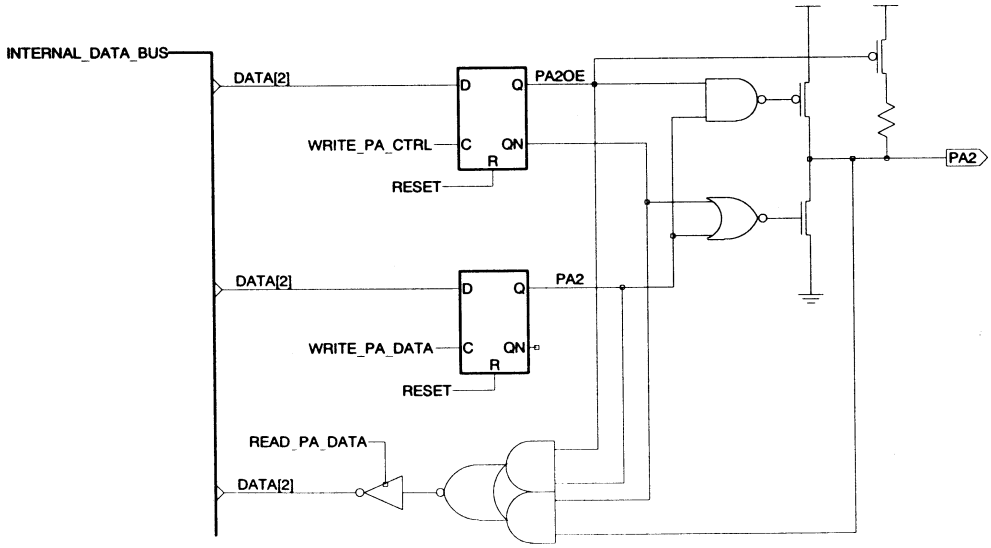


**Fig.3 Structure of PA2**



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## SYNC Processor

The functional block diagram of SYNC Processor is shown in Fig. 4. It contains H and V polarity detection circuit, H and V frequency counter, composite sync signal separation circuit, free-running H and V sync signal generator, vedio signal generation circuit for burn-in test and clamp pulse generator.

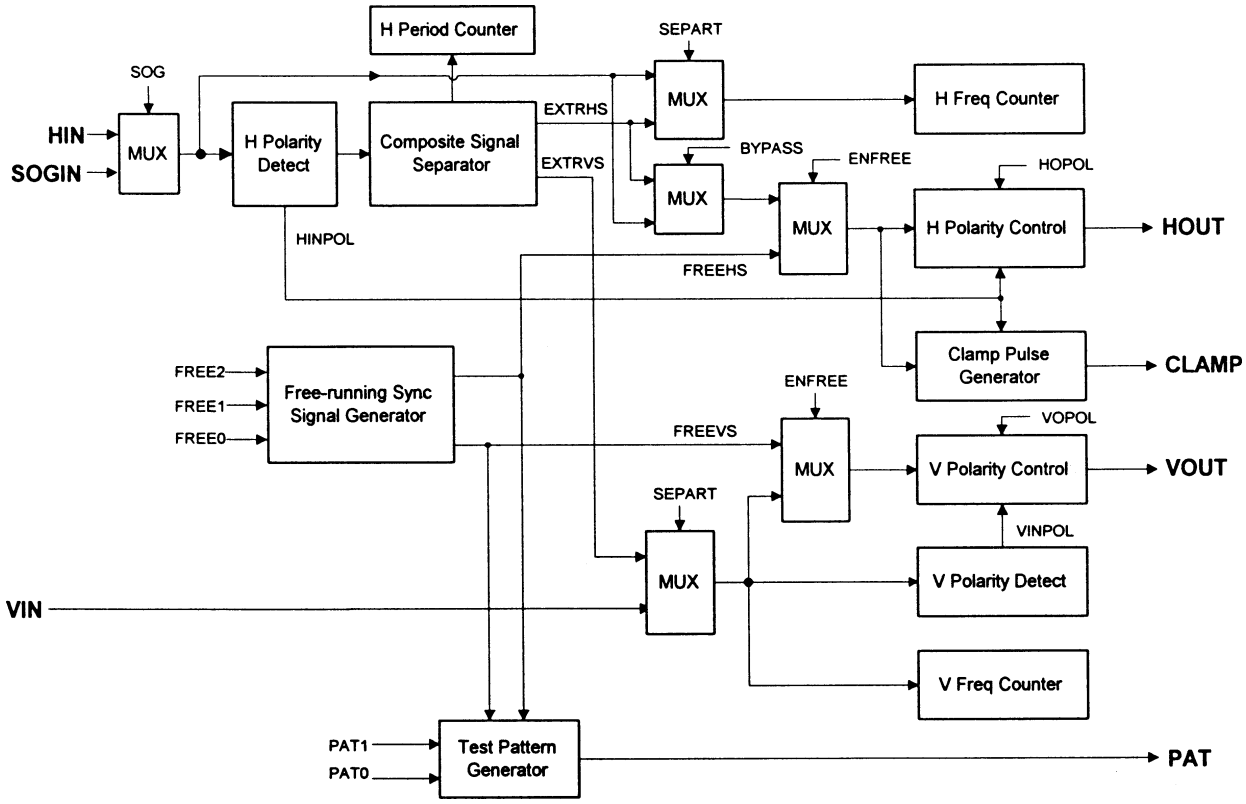


**Fig.4 Block diagram of sync signal processor**

### Horizontal Polarity Detect

The horizontal polarity is detected by sampling HIN signal at 5.5~6.5us after rising and falling edge of HIN. If the result of sampling is low and lasts 192~256us with no change, the polarity is positive (HINPOL=1). If the result of sampling is high and lasts 192~256us with no change, the polarity is negative (HINPOL=0).

### Vertical Polarity Detect

Vertical polarity is detected by sampling VIN level at 2.048ms after rising edge of VIN. If the level is low, the polarity is positive (VINPOL=1). If the level is high, the polarity is negative (VINPOL=0). But if SEPART bit is set, the VINPOL bit is “1” because the Vsync from composite signal separator is always positive polarity.

### Output Polarity Control

The polarities of HOUT and VOUT are controlled by HOPOL and VOPOL bites. When the bit is set, the output polarity is positive. When the bit is cleared, the output polarity is negative.



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**Composite Sync Signal Separator**

Composite sync signal separator extract Vsync signal from HIN or SOGIN input pin by filtering pulses which is less than 6us. The output Vsync signal will be widened about 5.5~6.5us. The output Hsync will be replaced by 2us pulse during Vsync pulse.

The composite sync signal separator can handle H+V and H exclusive OR V signals. Fig. 5 shows the timig relationship of the extracted H and V sync signals.

If Hsync output do not want to insert pseudo H pulses (EXTRHS signal) during Vsync pulse, set BYPASS bit can let HOUT pin output waveform same as Hsync input (Note: polarity can be controlled by HOPOL bit).

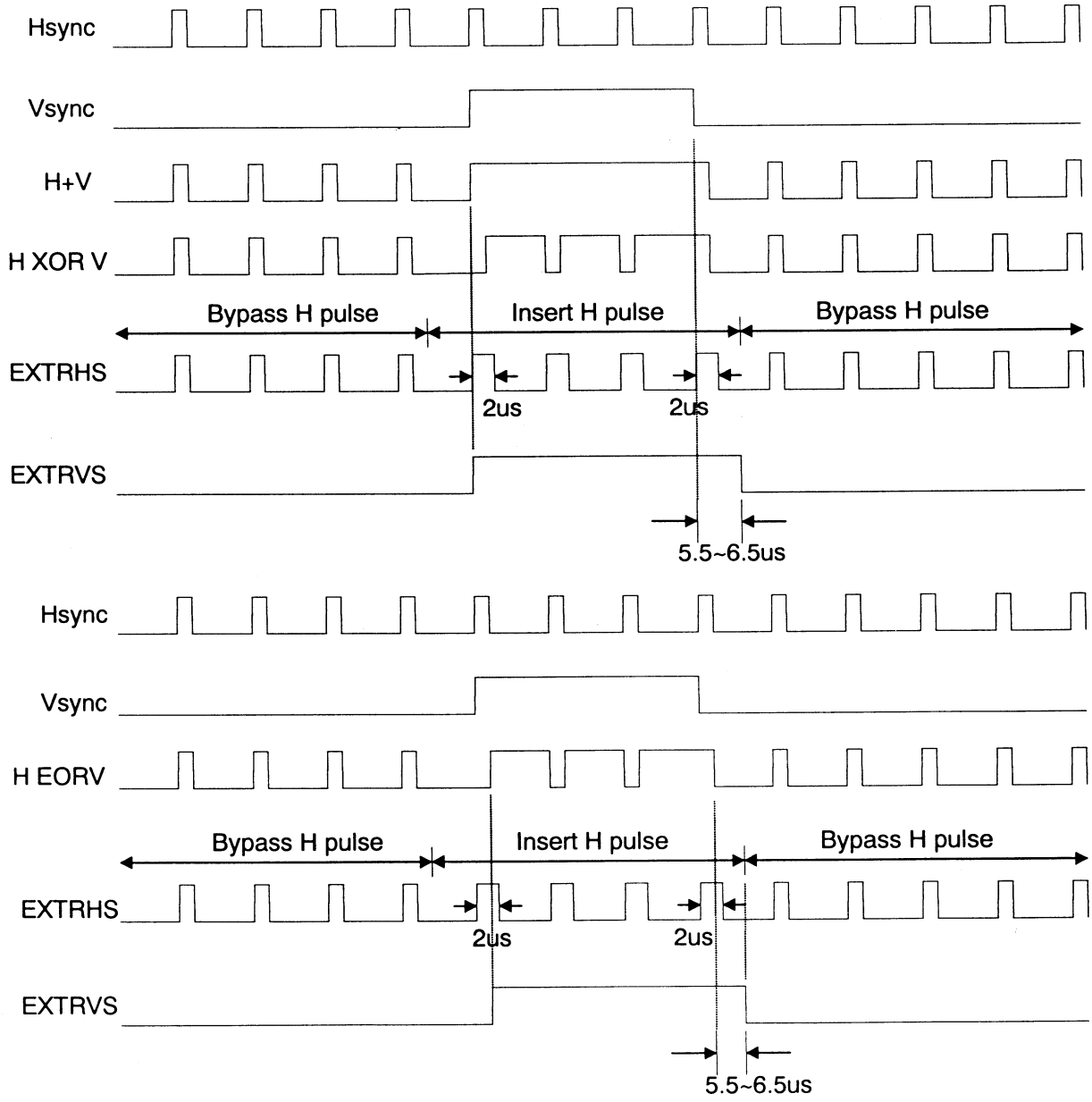


**Fig.6 Timing relationship of composite sync signal separator**



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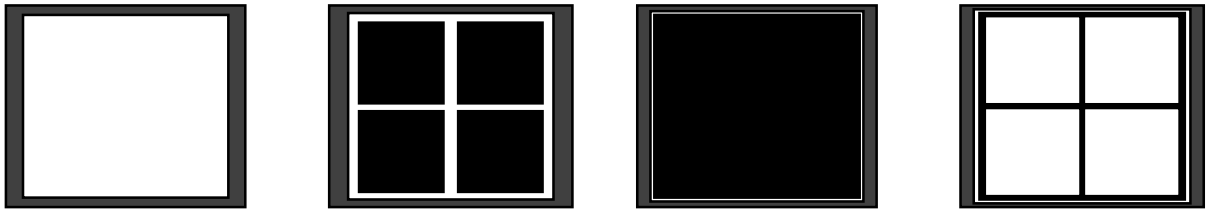
Free-running sync signal and self-test pattern

The self-generated free run sync signals are output from HOUT and VOUT pins when ENFREE bit is set. Four kinds of standard VESA timings are selected by FREE1 and FREE0 bits.

Self-test pattern signal is output form PAT pin when ENPAT bit is set. PAT1 and PAT0 bits select different self-test pattern.



PAT1 = 0, PAT0 = 0 PAT1 = 0, PAT0 = 1 PAT1 = 1, PAT0 = 0 PAT1 = 1, PAT0 = 1

**Fig. 7 Test Pattern**

| | | X00 | X01 | 010 | 011 | 110 | 111 |
|---|---|---|---|---|---|---|---|
| $F_H$ | Hot frequency | 31.496kHz | 48kHz | 63.83kHz | 81.25kHz | 90.909kHz | 106.195kHz |
| $F_V$ | Ver frequency | 59.993Hz | 72.072Hz | 59.878Hz | 64.865Hz | 84.8Hz | 84.96Hz |
| $T_{HT}$ | Hor total time | 31.75us | 20.833us | 15.667us | 12.333us | 11us | 9.417us |
| $T_{VT}$ | Ver total time | 16.669ms | 13.875ms | 16.7ms | 15.417ms | 11.792ms | 11.771ms |
| $T_{HS}$ | H sync time | 3.833us | 2.417us | 1us | 1.083us | 1us | 0.833us |
| $T_{HB}$ | H Back porch + H Left border | 2 us | 1.417us | 2.417us | 1.833us | 1.583us | 1.417us |
| $T_{HF}$ | H Front porch + H Right border | 0.708us | 1.125us | 0.542us | 0.375us | 0.375us | 0.292us |
| $T_{VS}$ | V sync time | 2 × $T_{HT}$ | 6 × $T_{HT}$ | 3 × $T_{HT}$ | 3 × $T_{HT}$ | 3 × $T_{HT}$ | 3 × $T_{HT}$ |
| $T_{VB}$ | V Back porch + V Top border | 33 × $T_{HT}$ | 23 × $T_{HT}$ | 38 × $T_{HT}$ | 46 × $T_{HT}$ | 44 × $T_{HT}$ | 46 × $T_{HT}$ |
| $T_{VF}$ | V Front porch + V Bottom border | 11 × $T_{HT}$ | 38 × $T_{HT}$ | 3 × $T_{HT}$ | 2 × $T_{HT}$ | 2 × $T_{HT}$ | 2 × $T_{HT}$ |
| $T_{VIDEO}$ | Video pulse width | 41.67ns | 41.67ns | 41.67ns | 41.67ns | 41.67ns | 41.67ns |

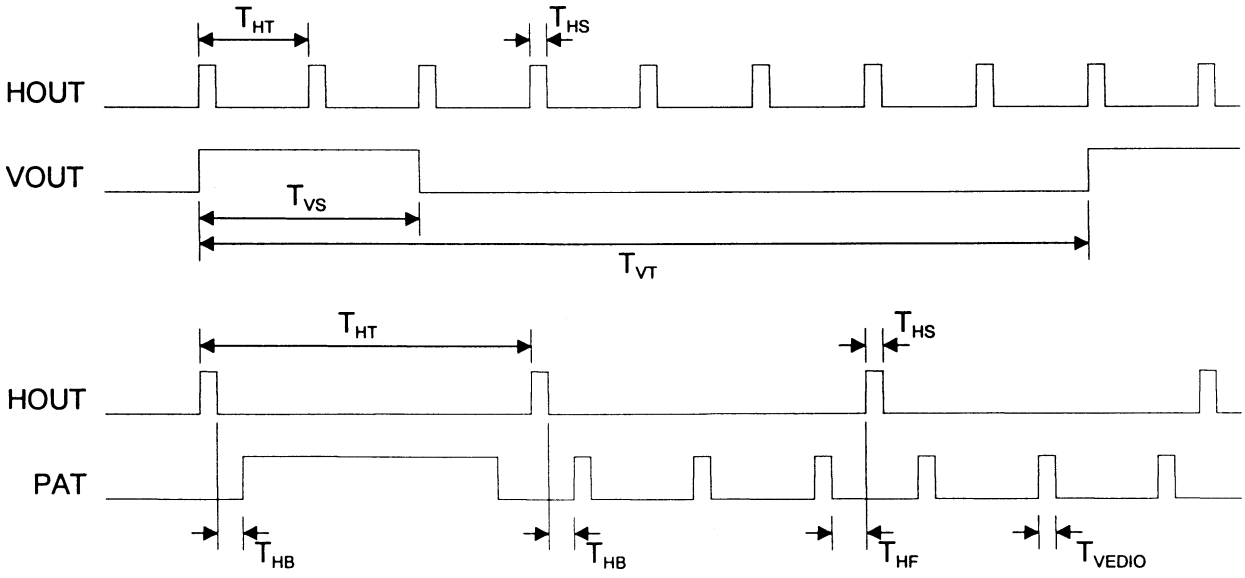



**Fig.8 Free-running sync signal and test pattern timing**



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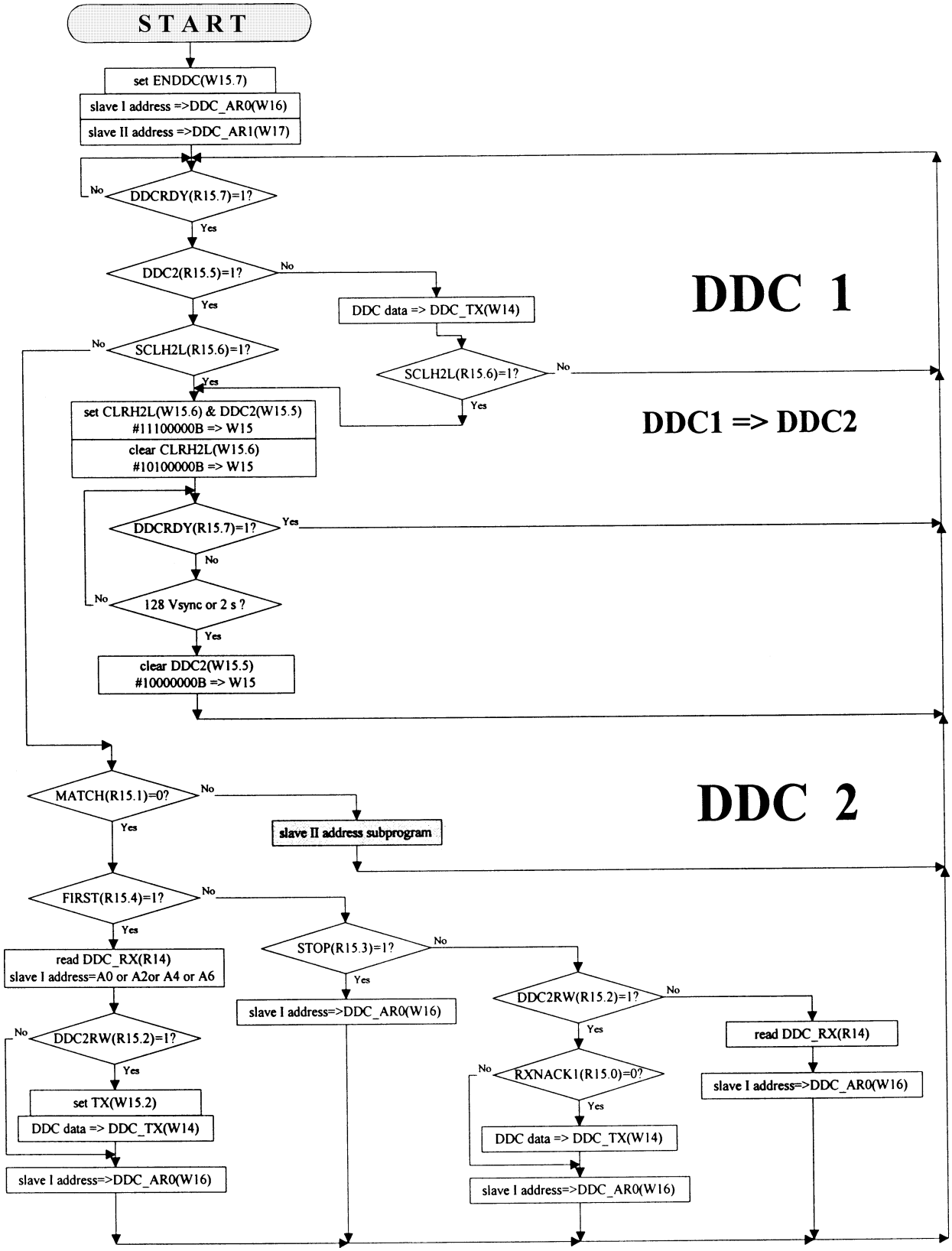
## DDC Flow Chart



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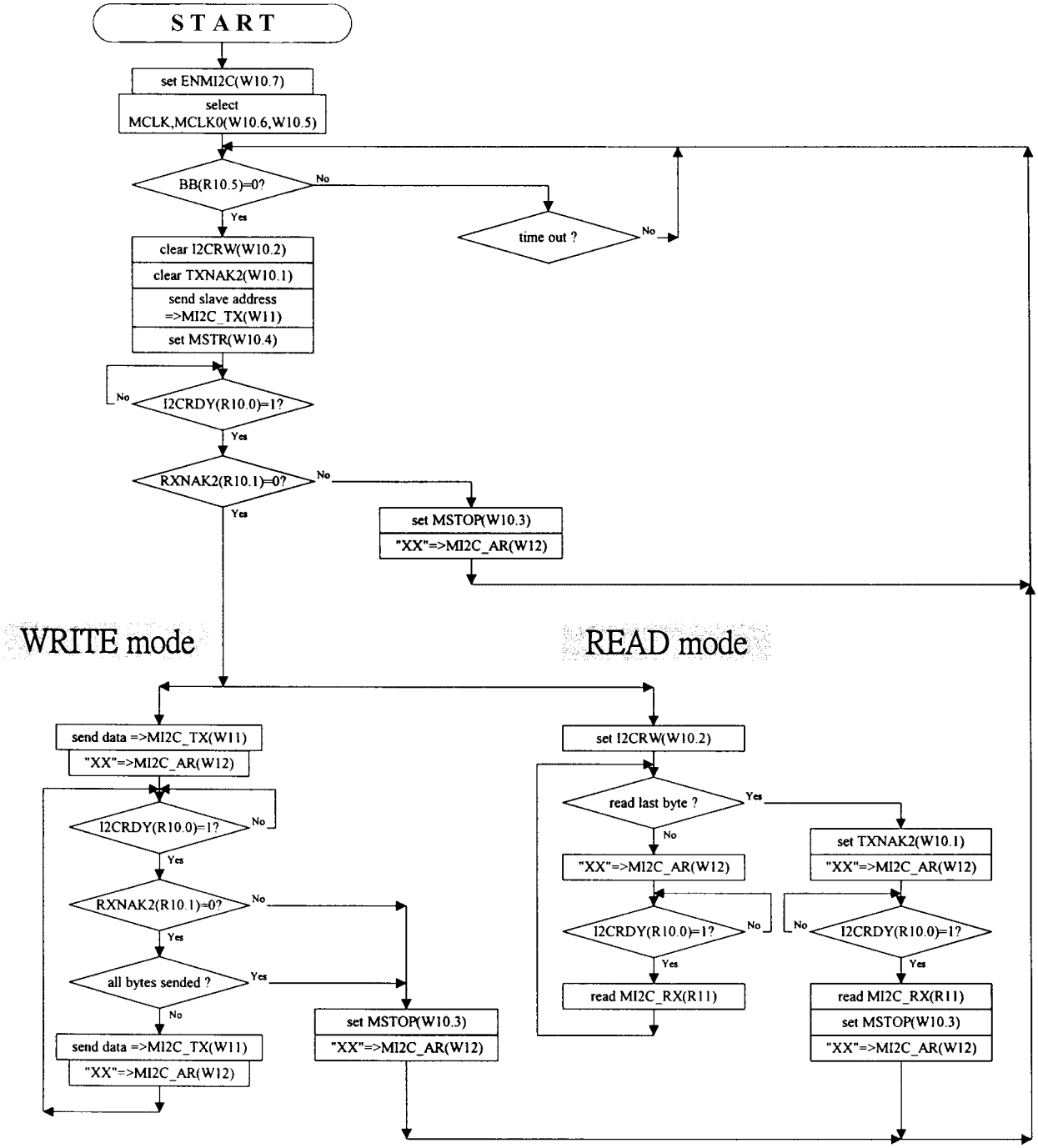
## Master I²C Flow Chart



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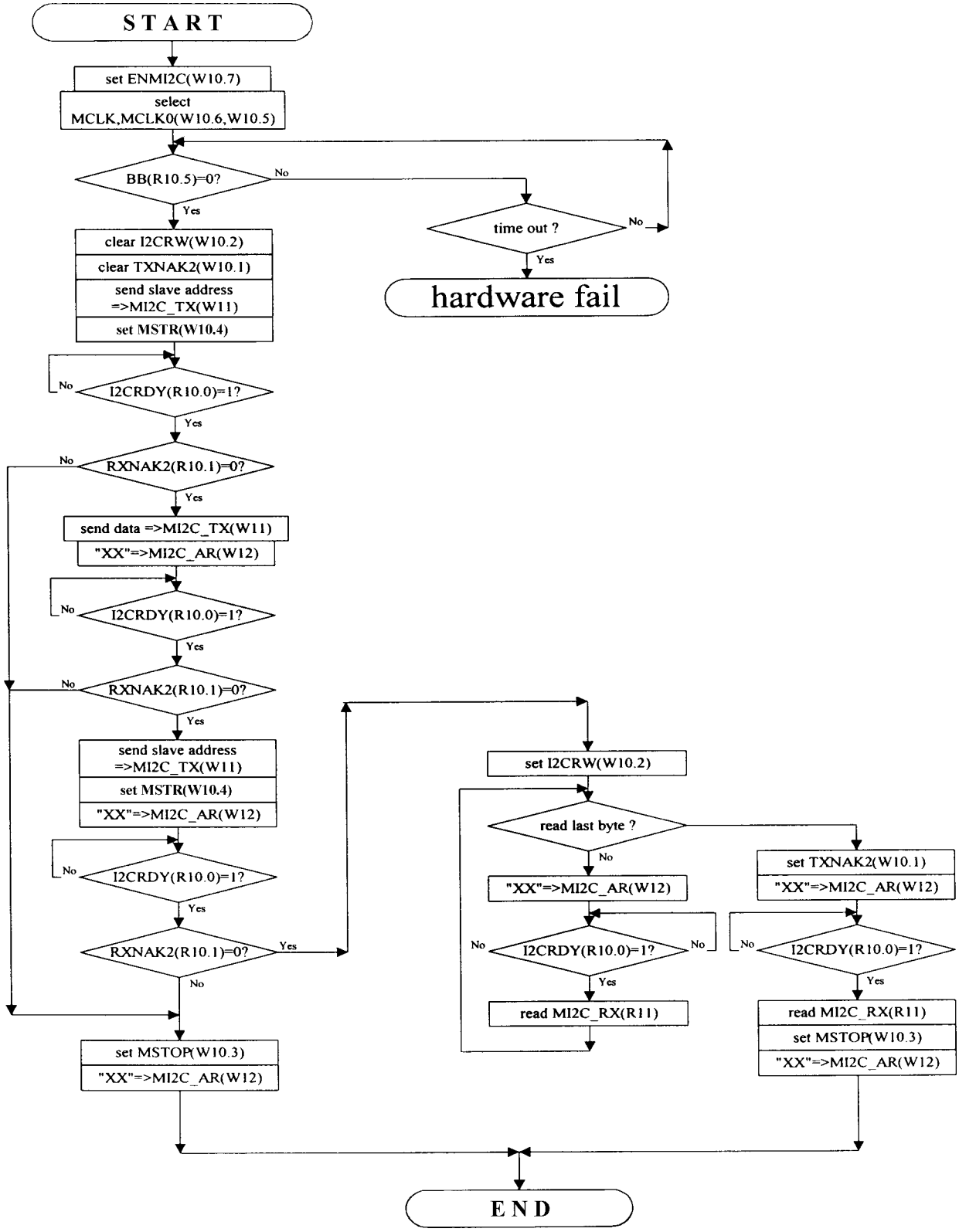
## Master I²C (restart mode) Flow Chart



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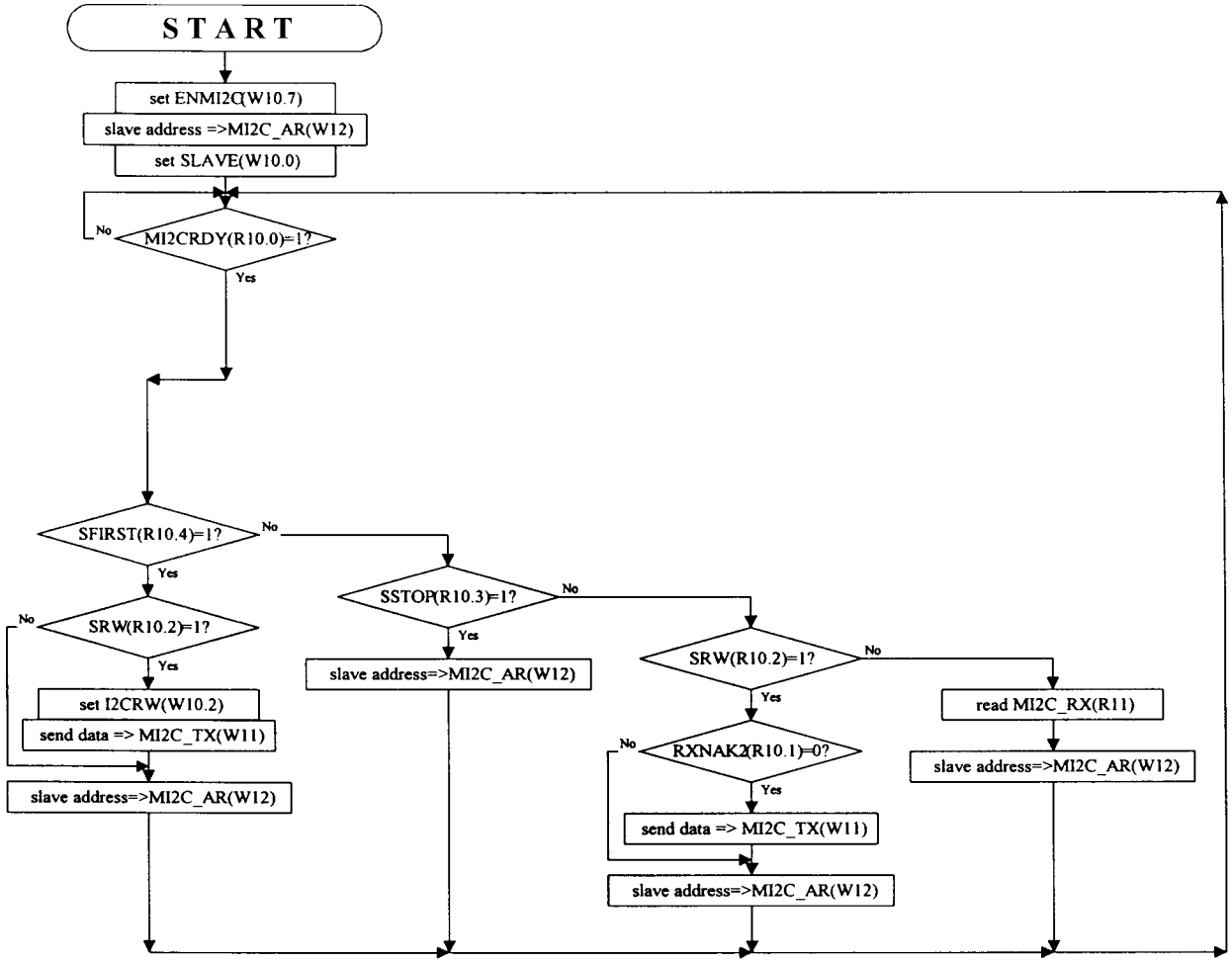
## Slave I²C Flow Chart



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## I²C-bus autosync deflection controller for PC monitors — TDA4857

### FEATURES

#### Concept features

- Full horizotal plus vertical autosync capability
- Extended horizontal frequency range from 15 to 130kHz
- Comprehensive set of I²C-bus driven geometry adjustments and functions, including standby mode
- Very good vertical linearity
- Moire cancellation
- Start-up and switch-off sequence for safe operation of all power components
- X-ray protection
- Power dip recognition
- Flexible switched mode B+ supply function block for feedback and feed forward converter
- Internally stabilized voltage reference
- Drive signal for focus amplifiers with combined horizontal and vertical parabola waveforms
- DC controllable inputs for Extremely High Tension (EHT) Compensation
- SDIP32 Package

#### Synchronization

- Can handle all sync signals (horizontal, vertical, composite and sync-on-video)
- Output for video clamping (leading/trailing edge selectable by the I²C-bus), vertical blanking and protection blanking
- Output for fast unlock status of horizontal synchronization and blanking on grid 1 of picture tube.

#### Horizontal section

- I²C-bus controllable wide range linear picture position, pin unbalance and parallelogram correction via horizontal phase
- Frequency-locked loop for smooth catching of horizontal frequency
- Simple frequency preset of fmin and fmax by external resistors
- Low jitter
- Soft start for horizontal and B+ control drive signals.

#### Vertical section

- I²C-bus controllable vertical picture size, picture position, linearity (S-correction) and linearity balance
- Output for the I²C-bus controllable vertical sawtooth and parabola (for pin unbalance and parallelogram)
- Vertical picture size independent of frequency
- Differential current outputs for DC coupling to vertical booster
- 50 to 160 Hz vertical autosync range.

#### East-West (EW) section

- I²C-bus controllable output for horizontal pincushion, horizontal size, corner and trapezium correction
- Optional tracking of EW drive waveform with line frequency selectable by the I²C-bus.

#### Focus section

- I²C-bus controllable output for horizontal and vertical parabolas
- Vertical parabola is independent of frequency and tracks with vertical adjustments
- Horizontal parabola independent of frequency
- Adjustable pre-correction of delay in focus output stage.



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## BLOCK DIAGRAM

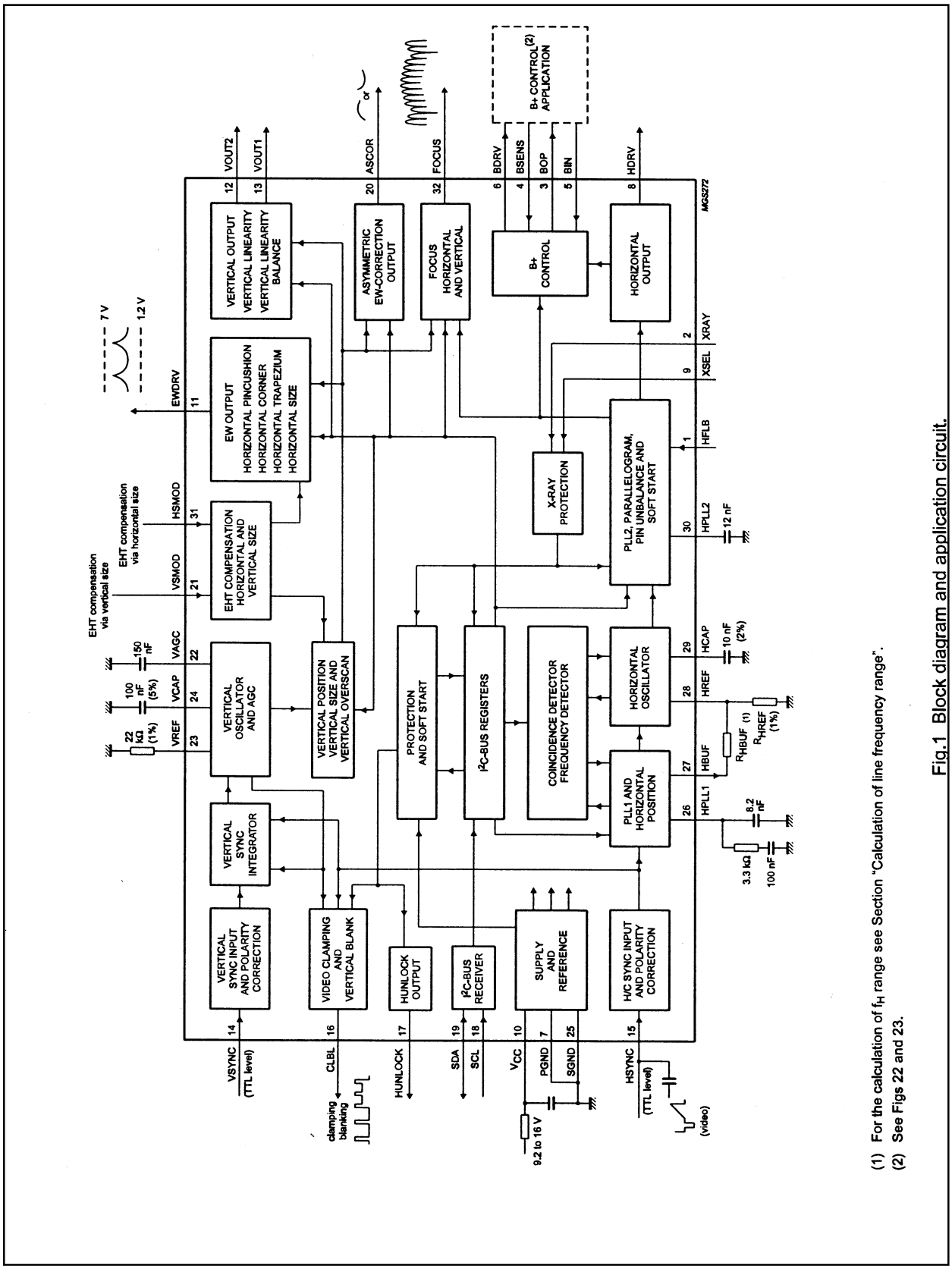


Fig.1 Block diagram and application circuit.

(1) For the calculation of $f_H$ range see Section "Calculation of line frequency range".
(2) See Figs 22 and 23.



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## PINNING

| SYMBOL | PIN | DESCRIPTION |
|---|---|---|
| HFLB | 1 | horizontal flyback input |
| XRAY | 2 | X-ray protection input |
| BOP | 3 | B+ control OTA output |
| BSENS | 4 | B+ control comparator input |
| BIN | 5 | B+ control OTA input |
| BDRV | 6 | B+ control driver output |
| PGND | 7 | power ground |
| HDRV | 8 | horizontal driver output |
| XSEL | 9 | select input for X-ray reset |
| Vcc | 10 | supply voltage |
| EWDRV | 11 | EW waveform output |
| VOUT2 | 12 | vertical output 2 (ascending sawtooth) |
| VOUT1 | 13 | vertical output 1 (descending sawtooth) |
| VSYNC | 14 | vertical synchronization input |
| HSYNC | 15 | horizontal/composite synchronization input |
| CLBL | 16 | video clamping pulse/vertical blanking output |
| HUNLOCK | 17 | horizontal synchronization unlock/protection/vertical blanking output |
| SCL | 18 | I²C-bus clock input |
| SDA | 19 | I²C-bus data input/output |
| ASCOR | 20 | output for asymmetric EW corrections |
| VSMOD | 21 | input for EHT compensation (via vertical size) |
| VAGC | 22 | external capacitor for vertical amplitude control |
| VREF | 23 | external resistor for vertical oscillator |
| VCAP | 24 | external capacitor for vertical oscillator |
| SGND | 25 | signal ground |
| HPLL1 | 26 | external filter for PLL1 |
| HBUF | 27 | buffered f/v voltage output |
| HREF | 28 | reference current for horizontal oscillator |
| HCAP | 29 | external capacitor for horizontal oscillator |
| HPLL2 | 30 | external filter for PLL2/soft start |
| HSMOD | 31 | input for EHT compensation (via horizontal size) |
| FOCUS | 32 | output for horizontal and vertical focus |



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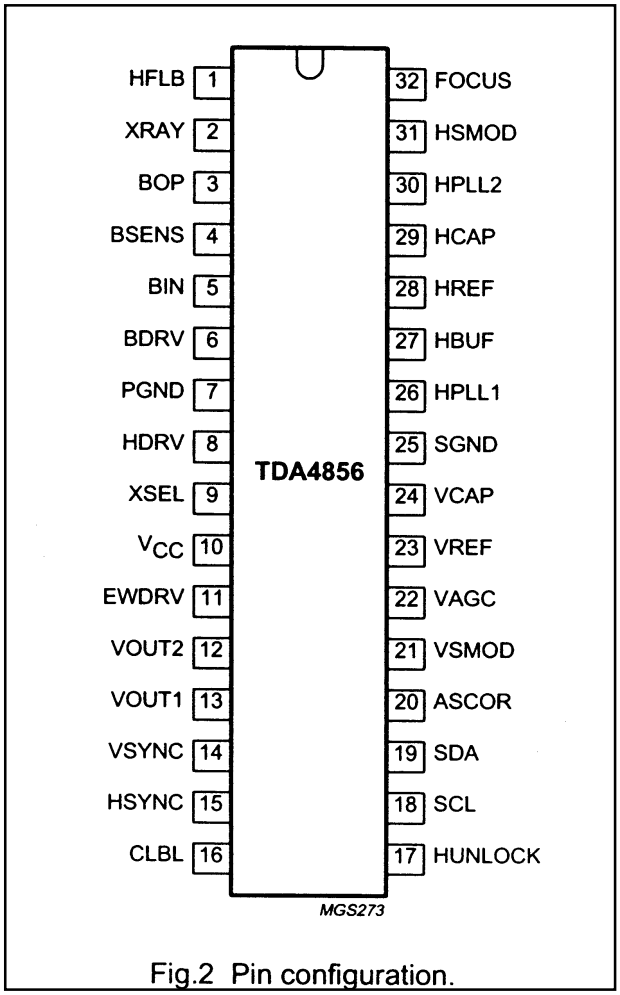


Fig.2 Pin configuration.

## FUNCTIONAL DESCRIPTION

### Horizontal sync separator and polarity correction

HSYNC (pin 15) is the input for horizontal synchronization signals, which can be DC-coupled TTL signals (horizontal or composite sync) and AC-coupled negative-going video sync signal. Video syncs are clamped to 1.28V and sliced at 1.4V. This results in a fixed absolute slicing level of 120 mV related to top sync.

For DC-coupled TTL signals the input clamping current is limited. The slicing level for TTL signals is 1.4 V.

The separated sync signal (either video or TTL) is integrated on an internal capacitor to detect and normalize the sync polarity.

Normalized horizontal sync pulses are used as input signals for the vertical sync integrator, the PLL1 phase detector and the frequency-locked loop.

### Vertical sync integrator

Normalized composite sync signals from HSYNC are integrated on an internal capacitor in order to extract vertical sync pulses. The integration time is dependent on the horizontal oscillator reference current at HREF (pin 28). The integrator output directly triggers the vertical oscillator.

### Vertical sync slicer and polarity correction

Vertical sync signals (TTL) applied to VSYNC (pin 14) are sliced at 1.4V. The output signal of the sync slicer is integrated on an internal capacitor to detect and normalize the sync polarity. The output signals of vertical sync integrator and sync normalizer are disjuncted before they are fed to the vertical oscillator.

### Video clamping/vertical blanking generator

The video clamping/vertical blanking signal at CLBL (pin 16) is a two-level sandcastle pulse which is especially suitable for video ICs such as the TDA488x family, but also for direct applications in video output stages.

The upper level is the video clamping pulse, which is triggered by the horizontal sync pulse. Either the leading or trailing edge can be selected by setting control bit CLAMP via the I²C-bus. The width of the video clamping pulse is determined by an internal single-shot multivibrator.

The lower level of the sandcastle pulse is the vertical blanking pulse, which is derived directly from the internal oscillator waveform. It is started by the vertical sync and stopped with the start of the vertical scan. This results in optimum vertical blanking. Two different vertical blanking times are accessible, by control bit VBLK, via the I²C-bus.

Blanking will be activated continuously if one of the following conditions is true:

- Soft start of horizontal and B+ drive [voltage at HPLL2 (pin 30) pulled down externally or by the I²C-bus]
- PLL1 is unlocked while frequency-locked loop is in search mode
- No horizontal flyback pulses at HFLB (pin 1)
- X-ray protection is activated
- Supply voltage at Vcc (pin 10) is low

Horizontal unlock blanking can be switched off, by control bit BLKDIS, via the I²C-bus while vertical blanking is maintained.



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**Frequency-locked loop**

The frequency-locked loop can lock the horizontal oscillator over a wide frequency range. This is achieved by a combined search and PLL operation. The frequency range is preset by two external resistors and the

recommended maximum ratio is $\frac{f_{max}}{f_{max}} = \frac{6.5}{1}$

This can, for instance, be a range from 15.625 to 90kHz with all tolerance included.

Without a horizontal sync signal the oscillator will be free-running at $f_{min}$. Any change of sync conditions is detected by the internal coincidence detector. A deviation of more than 4% between horizontal sync and oscillator frequency switches the horizontal section into search mode. This means that PLL1 control currents are switched off immediately. The internal frequency detector then starts tuning the oscillator. Very small DC currents at HPLL1 (pin 26) are used to perform this tuning with a well defined change rate. When coincidence between horizontal sync and oscillator frequency is detected, the search mode is first replaced by a soft-lock mode which lasts for the first part of the next vertical period.
The soft-lock mode is then replaced by a normal PLL operation. This operation ensures smooth tuning and avoids fast changes of horizontal frequency during catching.

In this concept it is not allowed to load HPLL1.
The frequency dependent voltage at this pin is fed internally to HBUF (pin 27) via a sample-and-hold and buffer stange. The sample-and-hold stage removes all disturbances caused by horizontal sync or composite vertical sync from the buffered voltage. An external resistor connected between pins HBUF and HREF defines the frequency range.

**Out-of-lock indication (pin HUNLOCK)**

Pin HUNLOCK is floating during search mode, or if a protection condition is true. All this can be detected by the microcontroller if a pull-up resistor is connected to its own supply voltage.

For an additional fast vertical blanking at grid 1 of the picture tube a 1 V signal referenced to ground is available at this output. The continuous protection blanking (see Section “Video clamping/vertical blanking generator”) is also available at this pin. Horizontal unlock blanking can be switched off, by control bit BLKDIS via the I²C-bus while vertical blanking is maintained.

**Horizontal oscillator**

The horizontal oscillator is of the relaxation type and requires a capacitor of 10 nF at HCAP (pin 29).
For optimum jitter performance the value of 10 nF must not be changed.

The minimum oscillator frequency is determined by a resistor from HREF to ground. A resistor connected between pins HREF and HBUF defines the frequency range.

The reference current at pin HREF also defines the integration time constant of the vertical sync integration.

**Calculation of line frequency range**

The oscillator frequencies fmin and fmax must first be calculated. This is achieved by adding the spread of the relevant components to the highest and lowest sync frequencies $f_{sync(min)}$ and $f_{sync(max)}$. The oscillator is driven by the currents in $R_{HREF}$ and $R_{HBUF.}$

The following example is a 31.45 to 90 kHz application:

**Table 1** Calculation of total spread

| spread of | for $f_{max}$ | for $f_{min}$ |
|---|---|---|
| IC | ±3% | ±5% |
| CHCAP | ±2% | ±2% |
| RHREF, RHBUF | ±2% | ±2% |
| Total | ±7% | ±9% |

Thus the typical frequency range of the oscillator in this example is:

$$f_{max} = f_{sync(max)} \times 1.07 = 96.3\ kHz$$

$$f_{min} = \frac{f_{sync(min)}}{1.09} = 28.4\ kHz$$

The resistors $R_{HREF}$ and $R_{HBUF_{par}}$ can be calculated using the following formulae:

$$R_{HREF} = \frac{78 \times kHz \times k\Omega}{f_{min} + 0.0012 \times f_{min}^2\ [kHz]} = 2.61\ \Omega$$

$$R_{HBUFpar} = \frac{78 \times kHz \times k\Omega}{f_{max} + 0.0012 \times f_{max}^2\ [kHz]} = 726\Omega$$

The resistor $R_{HBUF_{par}}$ os calculated as the value to $R_{HREF}$ and $R_{HBUF}$ in parallel.



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The formulae for $R_{HBUF}$ also takes into account the voltage swing across this resistor:

$$R_{HBUF} = \frac{R_{HREF} \times R_{HBUFpar}}{R_{HREF} - R_{HBUFpar}} \times 0.8 = 805\,\Omega$$

**PLL1 phase detector**

The phase detector is a standard type using switched current sources, which are independent of horizontal frequency. It compares the middle of horizontal sync with a fixed point on the oscillator sawtooth voltage. The PLL1 loop filter is connected to HPLL1 (pin 26).

See also Section “Horizontal position adjustment and corrections”.

**Horizontal position adjustment and corrections**

Alinear adjustment of the relative phase between the horizontal sync and the oscillator sawtooth (in PLL1 loop) is achieved via register HPOS. Once adjusted, the relative phase remains constant over the whole frequency range.

Correction of pin unbalance and parallelogram is achieved by modulating the phase between oscillator sawtooth and horizontal flyback (in loop PLL2) via registers HPARAL and HPINBAL. If those asymmetric EW corrections are performed in the deflection stage, both registers can be disconnected from the horizontal phase via control bit ACD. This does not change the output at pin ASCOR.

**Horizontal moire cancellation**

To achieve a cancellation of horizontal moire (also known as ‘video moire’), the horizontal frequency is divided-by-two to achieve a modulation of the horizontal phase via PLL2. The amplitude is controlled by register HMOIRE. To avoid a visible structure on screen the polarity changes with half of the vertical frequency.
Control bit MOD disables the moire cancellation function.

**PLL2 phase detector**

The PLL2 phase detector is similar to the PLL1 detector and compares the line flyback pulse at HFLB (pin 1) with the oscillator sawtooth voltage. The control currents are independent of the horizontal frequency. The PLL2 detector thus compensates for the delay in the external horizontal deflection circuit by adjusting the phase of the HDRV (pin 8) output pulse.

An external modulation of the PLL2 phase is not allowed, because this would disturb the pre-correction of the horizontal focus parabola.

**Soft start and standby**

If HPLL2 is pulled to ground, either by an external DC current or by resetting register SOFTST, the horizontal output pulses and B+ control driver pulses will be inhibited. This means that HDRV (pin 8) and BDRV (pin 6) are floating in this state. In both cases PLL2 and the frequency-lock loop are disabled, and CLBL (pin 16) provides a continuous blanking signal and HUNLOCK (pin 17) is floating.

This option can be used for soft start, protection and power-down modes. When pin HPLL2 is released again, an automatic soft start sequence on the horizontal drive as well as on the B-drive output will be performed.

A soft start can only be performed if the supply voltage for the IC is a minimum of 8.6V.

The soft start timing is determined by the filter capacitor at HPLL2 (pin 30), which is charged with a constant current during soft start. In the beginning the horizontal driver stage generates very small output pulses. The width of these pulses increases with the voltage at HPLL2 until the final duty cycle is reached. The voltage at HPLL2 increases further and performs a soft start at BDRV (pin 6) as well. After BDRV has reached full duty cycle, the voltage at HPLL2 continues to rise until HPLL2 enters its normal operating range. The internal charge current is now disabled. Finally PLL2 and the frequency-locked loop are activated. If both functions reach normal operation, HUNLOCK (pin 17) switches from the floating status to normal vertical blanking, and continuous blanking at CLBL (pin 16) is removed.

**Output stage for line drive pulses [HDRV (pin 8)]**

An open-collector output stage allows direct drive of an inverting driver transistor because of a low saturation voltage of 0.3V at 20mA. To protect the line deflection transistor, the output stage is disabled (floating) for a low supply voltage at Vcc.

The duty cycle of line drive pulses is slightly dependent on the actual horizontal frequency. This ensures optimum drive conditions over the whole frequency range.



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### X-ray protection

The X-ray protection input XRAY (pin 2) provides a voltage detector with a precise threshold. If the input voltage at XRAY exceeds this threshold for a certain time, then control bit SOFTST is reset, which switches the IC into protection mode. In this mode several pins are forced into defined states:

HUNLOCK (pin 17) is floating
The capacitor connected to HPLL2 (pin 30) is discharged
Horizontal output stage (HDRV) is floating
B+ control driver stage (BDRV) is floating
CLBL provides a continuous blanking signal.

There are two different methods of restarting ways the IC:

1. XSEL (pin 9) is opeb-circuit or connected to ground. The control bit SOFTST must be set to logic 1 via the I²C-bus. Then the IC returns to normal operation via soft start.
2. XSEL (pin 9) is connected to Vcc via an external resistor. The supply voltage of the IC must be switched off for a certain period of time, before the IC can be restarted again using the standard power-on procedure.

### Vertical oscillator and amplitude control

This stage is designed for fast stabilization of vertical size after changes in sync frequency conditions.
The free-running frequency $f_{fr(v)}$ is determined by the resistor $R_{VREF}$ connected to pin 23 and the capacitor $C_{VCAP}$ connected to pin 24. The value of $R_{VREF}$ is not only optimized for noise and linearity performance in the whole vertical and EW section, but also influences several internal reference. Therefore the value of $R_{VREF}$ must not be changed. Capacitor $C_{VCAP}$ should be used to select the free-running frequency of the vertical oscillator in accordance with the following formula:

$$f_{fr(V)} = \frac{1}{10.8 \times R_{VREF} \times C_{VCAP}}$$

To achieve a stabilized amplitude the free-running frequency ffr(v), without adjustment, should be at least 10% lower than the minimum trigger frequency.
The contributions shown in Table 2 canbe assumed.

**Table 2** Calculation of $f_{fr(V)}$ total spread

| Contributing elements | |
|---|---|
| Minimum frequency offset between $f_{fr(v)}$ and lowest trigger frequency | 10% |
| Spread of IC | ±3% |
| Spread of $R_{VREF}$ | ±1% |
| Spread of $C_{VCAP}$ | ±5% |
| Total | 19% |

Result for 50 to 160Hz application:

$$f_{fr(V)} = \frac{50\,Hz}{1.19} = 42\,Hz$$

The AGC of the vertical oscillator can be disabled by setting control bit AGCDIS via the I²C-bus. Aprecise external current has to be injected into VCAP (pin 24) to obtain the correct vertical size. This special application mode can be used when the vertical sync pulses are serrated (shifted); this condition is found in some display modes, e.g. when using a 100Hz up converter for video signals.

Application hint: VAGC (pin 22) has a high input impedance during scan. Therefore, the pin must not be loaded externally otherwise non-linearities in the vertical output currents may occur due to the changing charge current during scan.

### Adjustment of vertical size, VGA overscan and EHT compensation

There are four different ways to adjust the amplitude of the differential output currents at VOUT1 and VOUT2.

1 Register VGIN changes the vertical size without affecting any other output signal of the IC. This adjustment is meant for factory alignments.
2 Register VSIZE changes not only the vertical size, but also provides the correct tracking of all other related waveforms (see section”Tracking of vertical adjustments”). This register should be used for user adjustments.
3 For the VGA350 mode register VOVSCN can activate a +17% step in vertical size.
4 VSMOD (pin 21) can be used for a DC controlled EHT compensation of vertical size by correcting the differential output currents at VOUT1 and VOUT2. The EW waveforms, vertical focus, pin unbalance and parallelogram corrections are not affected by VSMOD.



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**Adjustment of vertical position, vertical linearity and vertical linearity balance**

Register VOFFS provides a DC shift at the sawtooth outputs VOUT1 and VOUT2 (pin 13 and 12) without affecting any other output waveform. This adjustment is meant for factory alignments.

Register VPOS provides a DC shift at the sawtooth output VOUT1 and VOUT2 with correct tracking of all other related waveforms (see Section “Tracking of vertical adjustments”). This register should be used for user adjustments. Due to the tracking the whole picture moves vertically while maintaining the correct geometry.

Register VLIN is used to adjust the amount of the vertical S-correction in the output signal. This function can be switched off by control bit VSC.

Register VLINBAL is used to correct the unbalance of vertical S-correction in the output signal.

**Tracking of vertical adjustments**

The adjustments via registers VSIZE, VOVSCN and VPOS also affect the waveforms of horizontal pincushion, vertical linearity (S-correction), vertical linearity balance, focus parabola, pin unbalance and parallelogram correction. The result of this interaction is that no readjustment of these parameters is necessary after an user adjustment of vertical picture size and vertical picture position.

**Adjustment of vertical moire cancellation**

To achieve a cancellation of vertical moire (also known as ‘scan moire’) the vertical picture position can be modulated by half the vertical frequency. The amplitude of the modulation is controlled by register VMOIRE and can be switched off via control bit MOD.

**Horizontal pincushion (including horizontal size, corner correction and trapezium correction)**

EWDRV (pin 11) provides a complete EW drive waveform. The components horizontal pincushion, horizontal size, corner correction and trapezium correction are controlled by the registers HPIN, HSIZE, HCORT, HCORB and HTRAP.

The corner correction can be adjusted separately for the top (HCORT) and bottom (HCORB) part of the picture.

The pincushion (EW parabola) amplitude, corner and trapezium correction track with the vertical picture size (VSIZE) and also with the adjustment for vertical picture position (VPOS). The corner correction does not track with the horizontal pincushion (HPIN).

Further the horizontal pincushion amplitude, corner and trapezium correction track with the horizontal picture size, which is adjusted via register HSIZE and the analog modulation input HSMOD. If the DC component in the EWDRV output signal is increased via HSIZE or Ihsmod, the pincushion, corner and trapezium component of the EWDRV output will be reduced by a factor of

$$1 - \frac{V_{HSIZE} + V_{HEHT}\left(1 - \frac{H_{HSIZE}}{14.4V}\right)}{14.4V}$$

The value 14.4V is a virtual voltage for calculation only. The output pin can not reach this value, but the gain (and DC bias) of the external application should be such that the horizontal deflection is reduced to zero when EWDRV reaches 14.4V.

HSMOD (pin 31) can be used for a DC controlled EHT compensation by correcting horizontal size, horizontal pincushion, corner and trapezium. The control range at this pin tracks with the actual value of HSIZE. For an increasing DC component $V_{HSIZE}$ in the EWDRV output signal, the DC component $V_{HEHT}$ caused by $I_{HSMOD}$ will be reduced by a factor of $1 - \frac{V_{HSIZE}}{14.4V}$ as shown in the equation above.

The whole EWDRV voltage is calculated as follows:

$V_{EWDRV} = 1.2V + [V_{HSIZE} + V_{HEHT} \times f(HSIZE) + (V_{HPIN} + V_{HCOR} + V_{HTRAP}) \times g(HSIZE, HSMOD)]h(I_{HREF})$ where:

$$V_{HEHT} = \frac{I_{HSMOD}}{120\mu 2} \times 0.69$$

$$f(HSIZE) = 1 - \frac{V_{HSIZE}}{14.4V}$$

$$g(HSIZE,HSMOD) = 1 - \frac{V_{HSIZE} + V_{HEHT}\left(1 - \frac{V_{HSIZE}}{14.4V}\right)}{14.4V}$$

$$h(I_{HREF}) = 1 - \frac{I_{HREF}}{I_{HREF_{f\ =\ 70kHz}}}$$



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Two different modes of operation can be chosen for the EW output waveform via control bit FHMULT:

1. Mode 1
   Horizontal size is controlled via register HSIZE and causes a DC shift at the EWDRV output. The complete waveform is also multiplied internally by a signal proportional to the line frequency [which is detected via the current at HREF (pin 28)]. This mode is to be used for driving EW diode modulator stage which require a voltage proportional to the line frequency.

2. Mode 2
   The EW drive waveform does not track with the line frequency. This mode is to be used for driving EW modulators which require a voltage independent of the line frequency.

**Output stage for asymmetric correction waveforms [ASCOR (pin 20)]**

This output is designed as a voltage output for superimposed waveforms of vertical parabola and sawtooth. The amplitude and polarity of both signals can be change by registers HPARAL and HPINBAL via the I²C-bus.

**Application hint**: The TDA4856 offers two possibilities to control registers HPINBAL and HPARAL.

1. Control bit ACD = 1
   The two registers now control the horizontal phase by means of internal modulation of the PLL2 horizontal phase control. The ASCOR output (pin 20) can be left unused, but it will always provide an output signal because the ASCOR output stage is not influenced by the control bit ACD.

2. Control bit ACD = 0
   The internal modulation via PLL2 is disconnected. In order to obtain the required effect on the screen, pin ASCOR must now be fed to the DC amplifier which controls the DC shift of the horizontal deflection. This option is useful for applications which already use a DC shift transformer.

If the tube does not need HPINBAL and HPARAL, then pin ASCOR can be used for other purposes, i.e. for a simple dynamic convergence.

**Dynamic focus section [FOCUS (pin 32)]**

This section generates a complete drive signal for dynamic focus applications. The amplitude of the horizontal parabola is internally stabilized, thus it is independent of the horizontal frequency. The amplitude can be adjusted via register HFOCUS. Changing horizontal size may require a correction of HFOCUS. To compensate for the delay in external focus amplifiers a ‘pre-correction’ for the phase of the horizontal parabola has been implemented. The amount of this pre-correction can be adjusted via register HFOCAD. The amplitude of the vertical parabola is independent of frequency and tracks with all vertical adjustments. The amplitude can be adjusted via register VFOCUS.

FOCUS (pin 32) is designed as a voltage output for the superimposed vertical and horizontal parabolas.

**B+ control function block**

The B+ control function block of the TDA4856 consists of an Operational Transconductance Amplifier (OTA), a voltage comparator, a flip-flop and a discharge circuit. This configuration allows easy applications for differnet B+ control concepts. See also Application Note AN96052: “B+ converter Topologies for Horizontal Deflection and EHT with TDA4855/58”.

GENERAL DESCRIPTION

The non-inverting input of the OTA is connected internally to a high precision reference voltage. The inverting input is connected to BIN (pin 5). An internal clamping circuit limits the maximum positive output voltage of OTA.
The output itself is connected to BOP (pin 3) and to the inverting input of the voltage comparator.
The non-inverting input of the voltage comparator can be accessed via BSENS (pin 4).

B+ drive pulses are generated by an internal flip-flop and fed to BDRV (pin 6) via an open-collector output stage.
This flip-flop is set at the rising edge of the signal at HDRV (pin 8). The falling edge of the output signal at BDRV has a defined delay of $t_{d(BDRV)}$ to the rising edge of the HDRV pulse.
When the voltage at BSENS exceeds the voltage at BOP, the voltage comparator output resets the flip-flop and, therefore, the open-collector stage at BDRV is floating again.



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An internal discharge circuit allows a well defined discharge of capacitors at BSENS. BDRV is active at a LOW-level output voltage (see Fig. 22), thus it requires an external inverting driver stage.

The B+ function block can be used for B+ deflection modulators in many different ways. Two popular application combinations are as follows:

- Boost converter in feedback mode (see Fig. 22)

  In this application the OTA is used as an error amplifier with a limited output voltage range. The flip-flop is set on the rising edge of the signal at HDRV. A reset will be generated when the voltage at BSENS, taken from the current sense resistor, exceeds the voltage at BOP.
  If no reset is generated within a line period, the rising edge of the next HDRV pulse forces the flip-flop to reset. The flip-flop is set immediately after the voltage at BSENS has dropped below the threshold voltage $V_{RESTART(BSENS)}$.

- Buck converter in feed forward mode

  This application uses an external RC combination at BSENS to provide a pulse width which is independent from the horizontal frequency. The capacitor is charged via an external resistor and discharged by the internal discharge circuit. For normal operation the discharge circuit is activated when the flip-flop is reset by the internal voltage comparator. The capacitor will now be discharged with a constant current until the internally controlled stop level $V_{STOP(BSENS)}$ is reached. This level will be maintained until the rising edge of the next HDRV pulse sets the flip-flop again and disables the discharge circuit.
  If no reset is generated within a line period, the rising edge of the next HDRV pulse automatically starts the discharge sequence and resets the flip-flop. When the voltage at BSENS reaches the threshold voltage $V_{RESTART(BSENS)}$, the discharge circuit will be disabled automatically and the flip-flop will be set immediately. This behaviour allows a definition of the maximum duty cycle of the B+ control drive pulse by the relationship of charge current to discharge current.

**Supply voltage stabilizer, references, start-up procedures and protection functions**

The TDA4857 provides an internal supply voltage stabilizer for excellent stabilization of all internal references. An internal gap reference, especially designed for low-noise, is the reference for the internal horizontal and vertical supply voltages. All internal reference currents and drive current for the vertical output stage are derived from this voltage via external resistors.

If eithr the supply voltage is below 8.3V or no data from the I²C-bus has been received after power-up, the internal soft start and protection functions fo not allow any of those outputs [HDRV, BDRV, VOUT1, VOUT2 and HUNLOCK] to be active.

For supply voltages below 8.3V the internal I²C-bus will not generated an acknowledge and the IC is in standby mode. This is because the internal protection circuit has generated a reset signal for the soft start register SOFTST. Above 8.3V data is accepted and all registers can be loaded. If the register SOFTST has received a set from the I²C-bus, the internal soft start procedure is released, which activates all above mentioned outputs.

If during normal operation the supply voltage has dropped below 8.1 V, the protection mode is activated and HUNLOCK (pin 17) changes to the protection status and is floating. This can be detected by the microcontroller.

This protection mode has been implemented in order to protect the deflection stages and the picture tube during start-up, shut-down and fault conditions. This protection mode can be activated as shown is Table 3.



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**Table 3** Activation of protection mode

| ACTIVATION | RESET |
|---|---|
| Low supply voltage at pin10 | increase supply voltage;<br>reload registers;<br>soft start via I²C-bus |
| Power dip, below 8.1 V | reload registers;<br>soft start via I²C-bus or via supply voltage |
| X-ray protection XRAY (pin 2) triggered | reload registers;<br>soft start via I²C-bus |
| HPLL2 (pin 30) externally pulled to ground | release pin 30 |

When the protection mode is active, several pins of the TDA4857 are forced into a defined state:

HDRV (horizontal driver output) is floating
BDRV (B+ control driver output) is floating
HUNLOCK (indicates, that the frequency-to-voltage converter is out of lock) is floating (HIGH-level via external pull-up resistor)
CLBL provides a continuous blanking signal
The capacitor at HPLL2 is discharged.

If the soft start procedure is activated via the I²C-bus, all of these actions will be performed in a well defined sequence.

**Power dip recognition**

In standby mode the I²C-bus will only answer with an acknowledge, when data is sent to control register with subaddress 1AH. This register contains the standby and soft start control bit.

If the I²C-bus master transmits data to another register, an aknowledge is given after the chip address and the subaddress; an acknowledge is not given after the data. This indicates that only in soft start mode data can be stored into normal registers.

If the supply voltage dips under 8.1 V the TDA4857 leaves normal operation mode and changes into standby mode. The microcontroller can check this state by sending data into a register with the subaddress 0XH. The acknowledge will only be given on the data if the TDA4857 is active.

Due to this behavior the start-up of the TDA4857 is defined as follows. The first data that is transferred to the TDA4857 must be sent to the control register with subaddress 1AH. Any other subaddress will not lead to an acknowledge. This is a limitation in checking the I²C-busses of the monitor during start-up.



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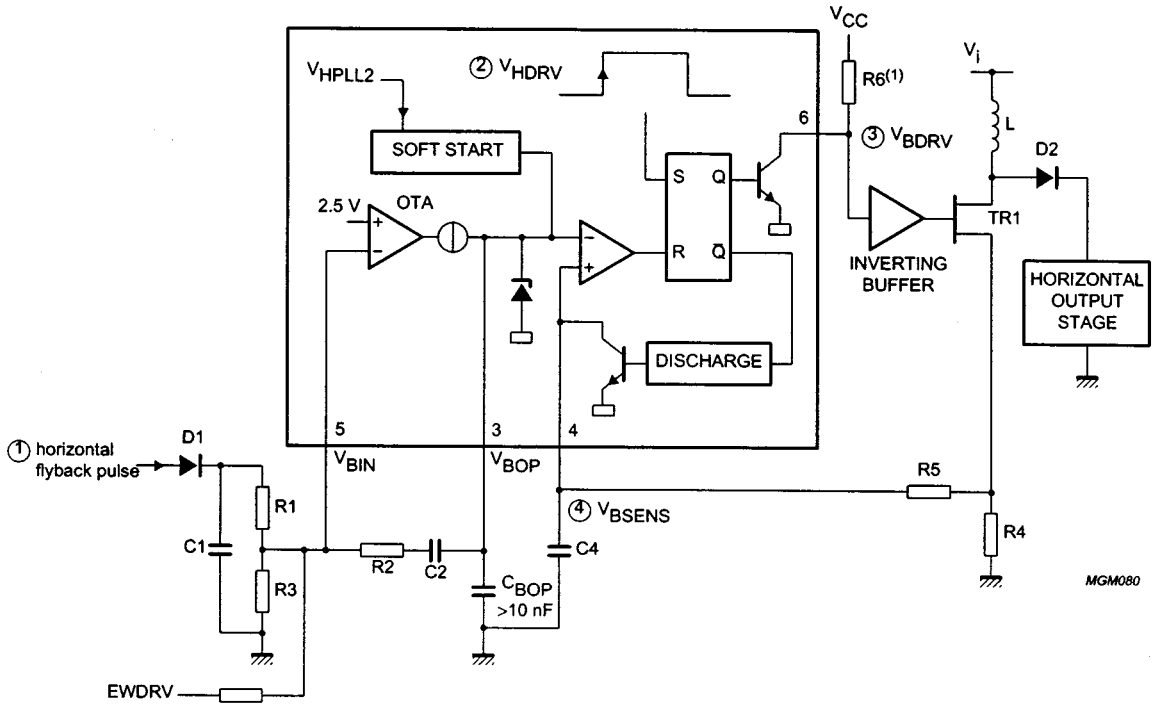
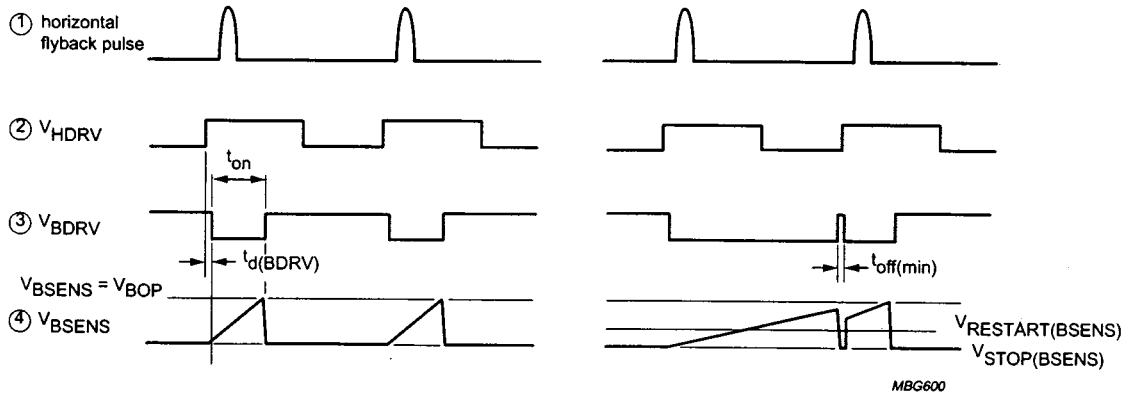
## APPLICATION INFORMATION




For f < 50 kHz and C2 < 47 nF calculation formulas and behaviour of the OTA are the same as for an OP. An exception is the limited output current at BOP (pin 3). See Chapter "Characteristics", Row Head "B+ control section; see Figs 22 and 23".

(1) The recommended value for R6 is 1 kΩ.

a. Feedback mode application.




b. Waveforms for normal operation.

c. Waveforms for fault condition.

Fig.22 Application and timing for feedback mode.



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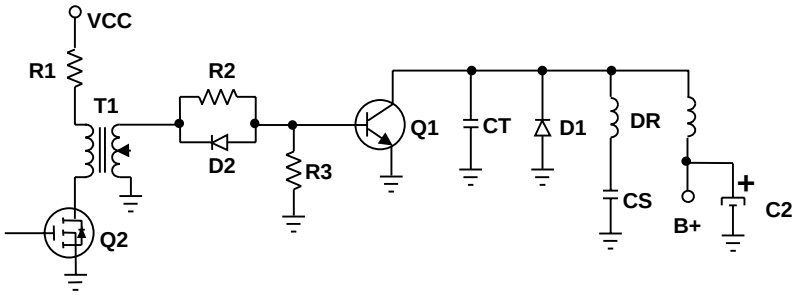
4. Horizontal drive and power supply output

**Circuit Diagram**

**Description of the circuit:**




1) R1, T1 and Q2 compose the horizontal driving circuit, and the transistor Q1 generates a horizontal output through the driving signal.

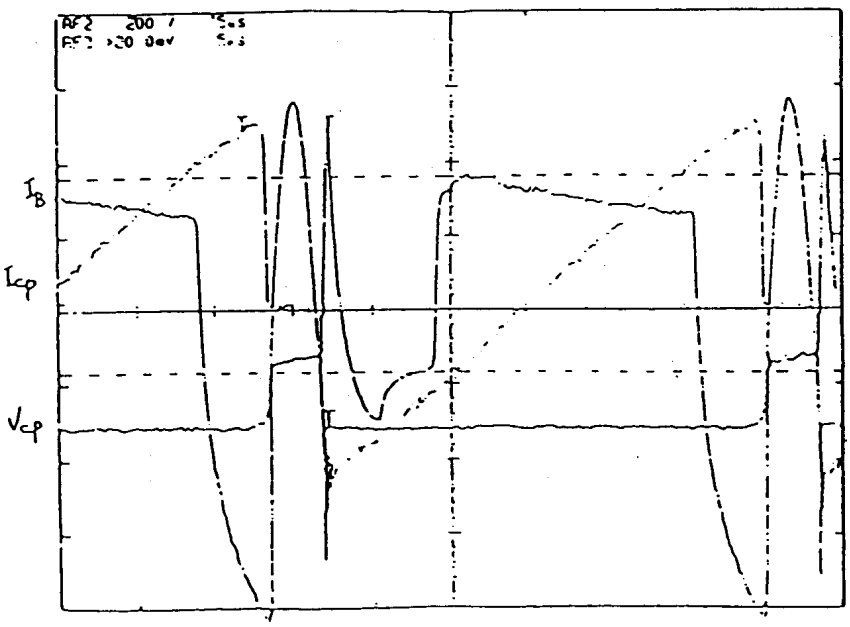
IB1 = $I_{CPMAX}$ / Q1$h_{feMIN}$

$I_{B2}$ ¡Ù3$I_{B1}$

di/dt ¡Ù3.3 A/us

2) The resistor R2 corrects the current IB1, the resistor R3 works as a damping resistor and leak resistor, and the diode D2 works as a discharging device and polar body.
As long as the transistor Q1 is OFF, the discharge is accelerated and the storage time (Tstg) is shortened.

3)H-OUT circuit waveform




Time 5uS/div



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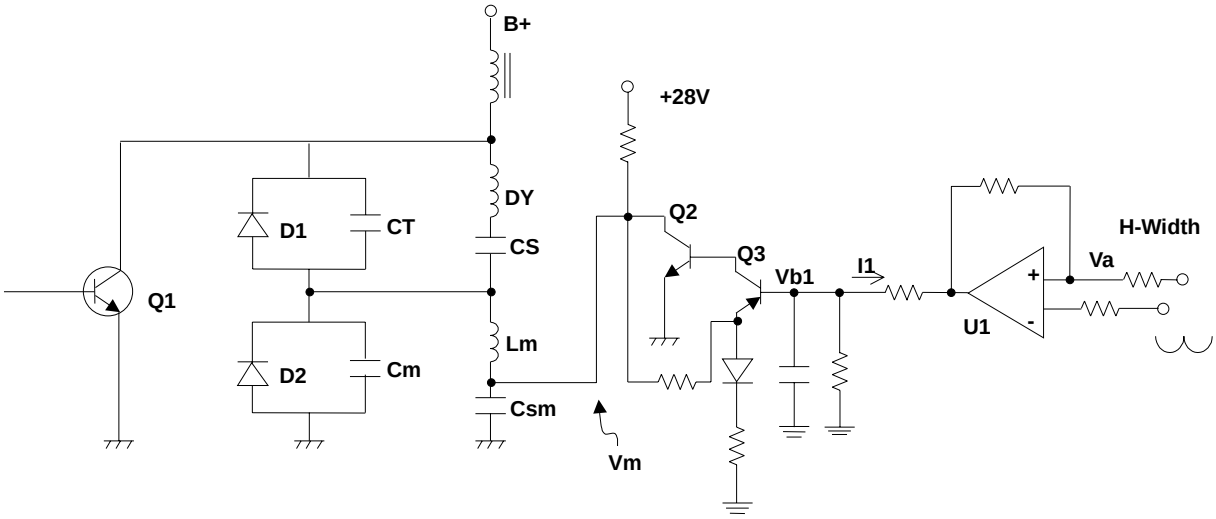
5. Horizontal amplitude control

**Circuit Diagram**




**Description of the circuit:**

1) The diodes D1 and D2 compose the bipolar modulation circuit, and have the function of controlling the currents of the oils DY(Ipp) and Lm(Im) through voltage modulation carried out by utilizing VM.
   B+ = Vm +Vcs  Therefore, Vcs = (Iy * Ly)/ts → Iy = (Vcs * ts)/Ly, with B+ fixed.
   Such being the case, the horizontal width decreases when Vm ↑ → Vc ↓ → Iy ↓
   Inversely, the horizontal width decreases when Vm ↓ → Vcs ↑ → Iy ↑
   (B+ = (Vp*2Tr)/(π*Ts), Tr = ▯LyCt, Tm = ▯LmCm)
2) Q2, Q3 and U1 compose the control circuit of H-WIDTH. Of those devices, the transistor Q2 and Q3 compose the Darlington current amplifier, and on the other operational amplifier U1 compose the emitter-coupled circuit, that stabilize the voltage and control the current.
3) The horizontal width broadens when Va ↑ → VbI ↓ → I1 ↑ → I2 ↑ → Vm ↓ →. An inference in the opposite sense is also possible.

**Test points for maintenance:**

1) $C_T$ = 31 to 37 kHz = 3.2 us
   48 to 64 kHz = 3.0 us
   Cm ÷ 2.8 us

2) $V_A$CENTER: 31 to 64 kHz ▯1.91 to 4.06V
   $V_M$CENTER: 31 to 64 kHz ▯11.6 to 27.4V



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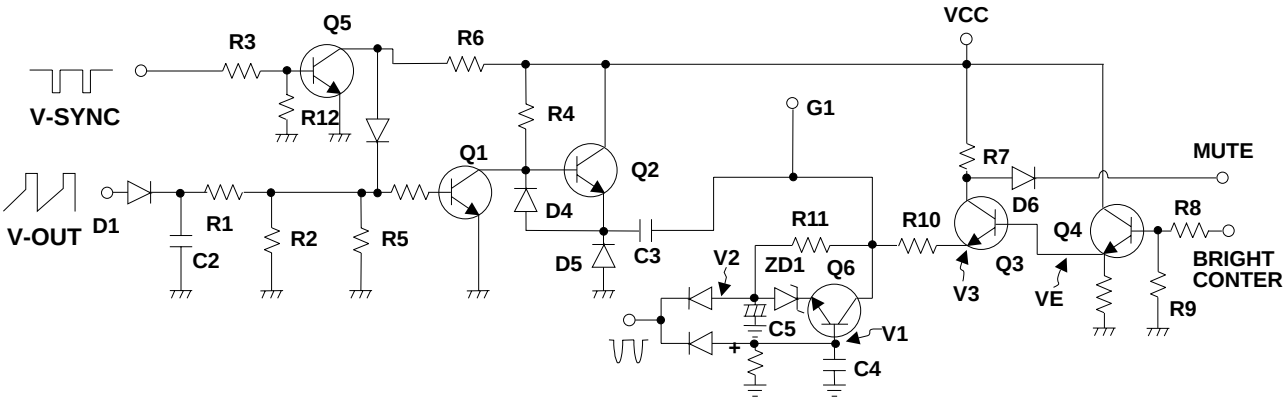
6. Blanking and spot killer

**Circuit Diagram**




**Description of the circuit:**

1) The vertical blanking circuit completes by Q1, Q2, Q3 and peripheral circuit.
   The vertical sync pulse applied to R3, R12 connected to Q5 base. Q5 is invert amplifier, then mixer with Q1 base together for compensate vertical retrace time of the blanking pulse.
2) The vertical amplifier output waveform through D1, C2, R1, R2 make waveform forming and clamp. Then applied to Q1 base, the vertical blanking amplifier of the Q1, the output connected to buffer Q2, through C3 coupling to G1 control circuit. D4, D5 for over voltage protect.
3) The Q6 is spot killer protect circuit, in normal power on stage.
   V1 = V2 and ZD1, so Q6 off. The CRT G1 voltage is fixed at –45 ~ –67$V_{DC}$ with vertical blanking pulse 12Vpp VG1 = – (V × R11) / (R10 + R11), (V = V1 – V3).
   When power off the voltage V1 > V2, then Q6 turn on pulling VG1 to –180V to protect CRT.
4) When Mute set to lower the Q3 off G1 = –180V screen cut off no picture display, this mute circuit makes active, at power ON/OFF and when mode change stage.
5) Q4 bias set up by MCU to control the $V_{CE}$ bias of Q3, then control G1 voltage output.

**Test points for maintenance:**

1) Check D1, R3 and Q1 collector
2) G1 voltage control range= –45 ~ –67VDC
   G1 off momentary voltage –180VAC



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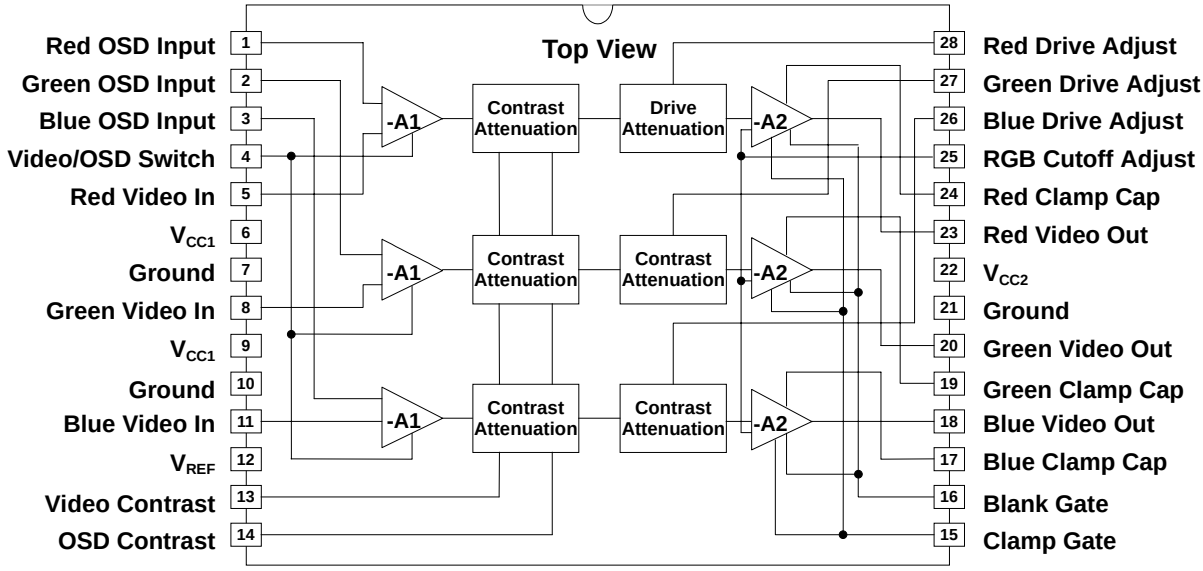
7. Video amplifier system with on-screen display

LM1281 (U201)

Outstanding features:
* Three-channel video amplifier bandwidth 85 MHz @ -3 dB (4 Vp-p output)
* OSD TTL input, bandwidth 50 MHz
* High-speed video/OSD changeover
* High impedance DC contrast control above the 0-4V, 40dB range
* High impedance DC OSD contrast control above the 0-4V, 40dB range

**BLOCK AND CONNECTION DIAGRAM**




Description of the functions

Figure 1 shows the block diagram of LM1281, in conformity with the pin layout of the IC.

Every channel accepts both the video signal and the OSD signal at the input anplifier (A1).

Also the video/OSD changeover signal passes either the video signal or the OSD signal through LM1281, or is connected with the input amplifier for control purposes. The next contrast adjustment block is a drive adjustment type one.

The reference level for the DC return circuit is set by means of the RGB cutoff adjustment pin (PIN 25).

Attention must be paid to the fact that the blank clamp gate is active when it is stuck at the LOW state.

Under ordinary circumstances, these pins are controlled by means of the standard TTL signal.



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Test Circuits

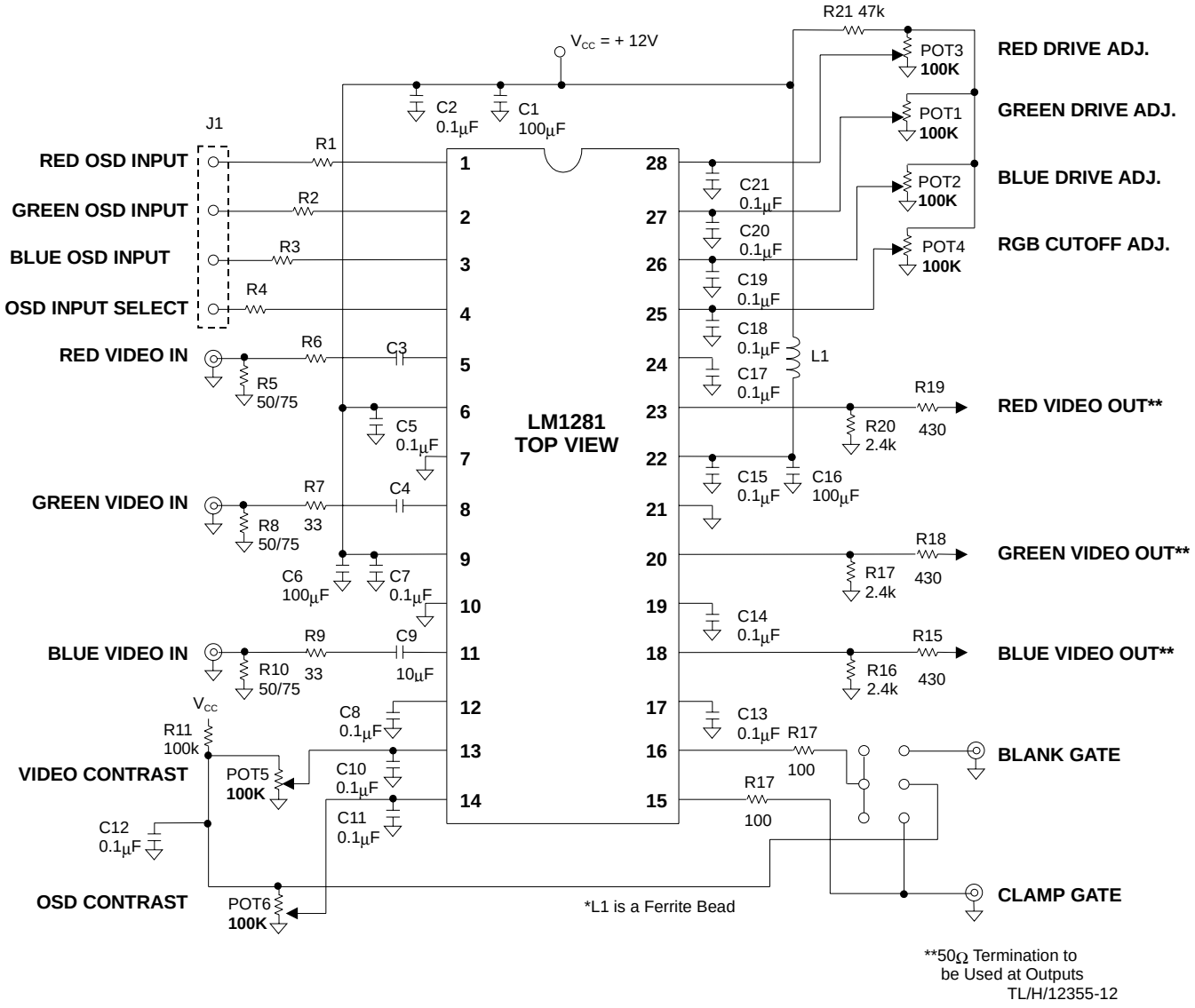


**FIGURE 2 LM1281 OSD Video Preamp Demonstration Board Schematic**



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National Semiconductor

August 1999

# LM2438
# Monolithic Triple 13.5 ns CRT Driver

## General Description

The LM2438 is an integrated high voltage CRT driver circuit designed for use in color monitor applications. The IC contains three high input impedance, wide band amplifiers which directly drive the RGB cathodes of a CRT. Each channel has its gain internally set to −14 and can drive CRT capacitive loads as well as resistive loads present in other applications, limited only by the package's power dissipation.

The IC is packaged in an industry standard 9-lead TO-220 molded plastic power package. See Thermal Considerations section.

## Features

- Well matched with LM1279 video preamp
- 0V to 5V input range
- Stable with 0–20 pF capacitive loads and inductive peaking networks
- Convenient TO-220 staggered lead package style
- Standard LM243X Family Pinout which is designed for easy PCB layout

## Applications

- 1024 x 768 displays up to 60 Hz refresh
- Pixel clock frequencies up to 60 MHz
- Monitors using video blanking

## Schematic and Connection Diagrams

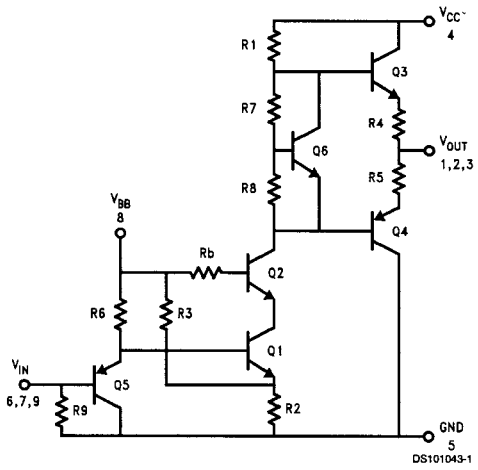
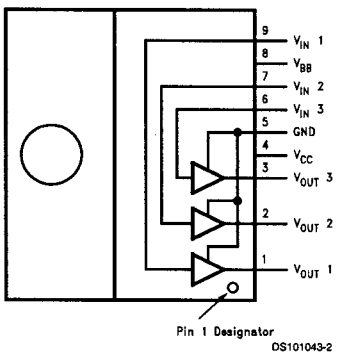



**FIGURE 1. Simplified Schematic Diagram (One Channel)**




**Note:** Tab is at GND

**Top View**
**Order Number LM2438T**

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## Theory of Operation

The LM2438 is a high voltage monolithic three channel CRT driver suitable for high resolution display applications. The LM2438 operates with 80V and 12V power supplies. The part is housed in the industry standard 9-lead TO-220 molded plastic power package.

The circuit diagram of the LM2438 is shown in *Figure 1*. The PNP emitter follower, Q5, provides input buffering. Q1 and Q2 form a fixed gain cascode amplifier with resistors R1 and R2 setting the gain at −14. Emitter followers Q3 and Q4 isolate the high output impedance of the cascode stage from the capacitance of the CRT cathode which decreases the sensitivity of the device to load capacitance. Q6 provides biasing to the output emitter follower stage to reduce crossover distortion at low signal levels.

*Figure 2* shows a typical test circuit for evaluation of the LM2438. This circuit is designed to allow testing of the LM2438 in a 50Ω environment without the use of an expensive FET probe. In this test circuit, the two 2.49 kΩ resistors form a 200:1 wideband, low capacitance probe when connected to a 50Ω coaxial cable and a 50Ω load (such as a 50Ω oscilloscope input). The input signal from the generator is ac coupled to the base of Q5.

## Application Hints

### INTRODUCTION

National Semiconductor (NSC) is committed to provide application information that assists our customers in obtaining the best performance possible from our products. The following information is provided in order to support this commitment. The reader should be aware that the optimization of performance was done using a specific printed circuit board designed at NSC. Variations in performance can be realized due to physical changes in the printed circuit board and the application. Therefore, the designer should know that component value changes may be required in order to optimize performance in a given application. The values shown in this document can be used as a starting point for evaluation purposes. When working with high bandwidth circuits, good layout practices are also critical to achieving maximum performance.

### IMPORTANT INFORMATION

The LM2438 performance is targeted for the XGA (1024 x 768, 60 Hz refresh) resolution market. The application circuits shown in this document to optimize performance and to protect against damage from CRT arcover are designed specifically for the LM2438. If another member of the LM243X family is used, please refer to its datasheet.

### POWER SUPPLY BYPASS

Since the LM2438 is a wide bandwidth amplifier, proper power supply bypassing is critical for optimum performance. Improper power supply bypassing can result in large overshoot, ringing or oscillation. 0.1 µF capacitors should be connected from the supply pins, $V_{CC}$ and $V_{BB}$, to ground, as close to the LM2438 as is practical. Additionally, a 47 µF or larger electrolytic capacitor should be connected from both supply pins to ground reasonably close to the LM2438.

### ARC PROTECTION

During normal CRT operation, internal arcing may occasionally occur. Spark gaps, in the range of 200V, connected from the CRT cathodes to CRT ground will limit the maximum voltage, but to a value that is much higher than allowable on the LM2438. This fast, high voltage, high energy pulse can damage the LM2438 output stage. The application circuit shown in *Figure 9* is designed to help clamp the voltage at the output of the LM2438 to a safe level. The clamp diodes, D1 and D2, should have a fast transient response, high peak current rating, low series impedance and low shunt capacitance. FDH400 or equivalent diodes are recommended. Do not use 1N4148 diodes for the clamp diodes. D1 and D2 should have short, low impedance connections to $V_{CC}$ and ground respectively. The cathode of D1 should be located very close to a separately decoupled bypass capacitor (C3 in *Figure 9*). The ground connection of D2 and the decoupling capacitor should be very close to the LM2438 ground. This will significantly reduce the high frequency voltage transients that the LM2438 would be subjected to during an arcover condition. Resistor R2 limits the arcover current that is seen by the diodes while R1 limits the current into the LM2438 as well as the voltage stress at the outputs of the device. R2 should be a ½W solid carbon type resistor. R1 can be a ¼W metal or carbon film type resistor. Having large value resistors for R1 and R2 would be desirable, but this has the effect of increasing rise and fall times. Inductor L1 is critical to reduce the initial high frequency voltage levels that the LM2438 would be subjected to. The inductor will not only help protect the device but it will also help minimize rise and fall times as well as minimize EMI. For proper arc protection, it is important to not omit any of the components shown in *Figure 9*.



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## Application Hints (Continued)

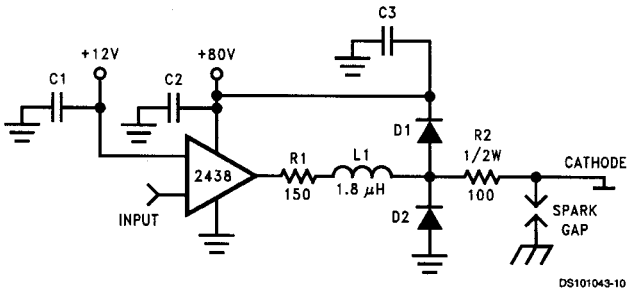


**FIGURE 9. One Channel of the LM2438 with the Recommended Application Circuit**

### OPTIMIZING TRANSIENT RESPONSE

Referring to *Figure 9*, there are three components (R1, R2 and L1) that can be adjusted to optimize the transient response of the application circuit. Increasing the values of R1 and R2 will slow the circuit down while decreasing overshoot. Increasing the value of L1 will speed up the circuit as well as increase overshoot. It is very important to use inductors with very high self-resonant frequencies, preferably above 300 MHz. Ferrite core inductors from J.W. Miller Magnetics (part #78F1R8K) were used for optimizing the performance of the device in the NSC application board. The values shown in *Figure 9* can be used as a good starting point for the evaluation of the LM2438. Using a variable resistor for R1 will simplify finding the value needed for optimum performance in a given application. Once the optimum value is determined the variable resistor can be replaced with a fixed value.

### EFFECT OF LOAD CAPACITANCE

*Figure 8* shows the effect of increased load capacitance on the speed of the device. This demonstrates the importance of knowing the load capacitance in the application. *Figure 8* also shows the effect inductance has on the rise and fall times.

### EFFECT OF OFFSET

*Figure 7* shows the variation in rise and fall times when the output offset of the device is varied from 40 to 50 $V_{DC}$. The rise time shows a maximum variation relative to the center data point (45 $V_{DC}$) of about 2%. The fall time shows a variation of about 2% relative to the center data point.

### THERMAL CONSIDERATIONS

*Figure 4* shows the performance of the LM2438 in the test circuit shown in *Figure 2* as a function of case temperature. The figure shows that the rise time of the LM2438 increases by approximately 5% as the case temperature increases from 50°C to 100°C. This corresponds to a speed degradation of 1% for every 10°C rise in case temperature. The fall time increases by approximately 7.5% as the case temperature increases from 50°C to 100°C. This corresponds to a speed degradation of 1.5% for every 10°C rise in case temperature.

*Figure 6* shows the maximum power dissipation of the LM2438 vs. Frequency when all three channels of the device are driving an 8 pF load with a 40 $V_{p-p}$ alternating one pixel on, one pixel off signal. The graph assumes a 72% active time (device operating at the specified frequency) which is typical in a monitor application. The other 28% of the time the device is assumed to be sitting at the black level (65V in this case). This graph gives the designer the information needed to determine the heat sink requirement for his application. The designer should note that if the load capacitance is increased the AC component of the total power dissipation will also increase.

The LM2438 case temperature must be maintained below 100°C. If the maximum expected ambient temperature is 70°C and the maximum power dissipation is 2.6W (from *Figure 6*, 30 MHz bandwidth) then a maximum heat sink thermal resistance can be calculated:

$$R_{TH} = \frac{100°C - 70°C}{2.6W} = 11.5°C/W$$

This example assumes a capacitive load of 8 pF and no resistive load.

### TYPICAL APPLICATION

A typical application of the LM2438 is shown in *Figure 11*. Used in conjunction with an LM1279, a complete video channel from monitor input to CRT cathode can be achieved. Performance is ideal for 1024 x 768 resolution displays with pixel clock frequencies up to 60 MHz. *Figure 11* is the schematic for the NSC demonstration board that can be used to evaluate the LM1279/2438 combination in a monitor.

### PC BOARD LAYOUT CONSIDERATIONS

For optimum performance, an adequate ground plane, isolation between channels, good supply bypassing and minimizing unwanted feedback are necessary. Also, the length of the signal traces from the preamplifier to the LM2438 and from the LM2438 to the CRT cathode should be as short as possible. The following references are recommended:

Ott, Henry W., "Noise Reduction Techniques in Electronic Systems", John Wiley & Sons, New York, 1976.

"Video Amplifier Design for Computer Monitors", National Semiconductor Application Note 1013.

Pease, Robert A., "Troubleshooting Analog Circuits", Butterworth-Heinemann, 1991.

Because of its high small signal bandwidth, the part may oscillate in a monitor if feedback occurs around the video channel through the chassis wiring. To prevent this, leads to the video amplifier input circuit should be shielded, and input circuit wiring should be spaced as far as possible from output circuit wiring.



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## Application Hints (Continued)

### NSC DEMONSTRATION BOARD

*Figure 12* shows the routing and component placement on the NSC LM1279/2438 demonstration board. The schematic of the board is shown in *Figure 11*. This board provides a good example of a layout that can be used as a guide for future layouts. Note the location of the following components:

- C54, C56—$V_{CC}$ bypass capacitor, located very close to pin 4 and ground pins
- C43, C44—$V_{BB}$ bypass capacitors, located close to pin 8 and ground
- C53, C55—Additional $V_{CC}$ bypass capacitors, near LM2438 and $V_{CC}$ clamp diodes. Very important for arc protection.

The routing of the LM2438 outputs to the CRT is very critical to achieving optimum performance. *Figure 13* shows the routing and component placement from pin 1 of the LM2438 to the red cathode. Note that the components are placed so that they almost line up from the output pin of the LM2438 to the red cathode pin of the CRT connector. This is done to minimize the length of the video path between these two components. Note also that D16, D17, R21 and D9 are placed to minimize the size of the video nodes that they are attached to. This minimizes parasitic capacitance in the video path and also enhances the effectiveness of the protection diodes. The anode of protection diode D17 is connected directly to a section of the the ground plane that has a short and direct path to the LM2438 ground pins. The cathode of D16 is connected to $V_{CC}$ very close to decoupling capacitor C53 (see *Figure 13*) which is connected to the same section of the ground plane as D17. The diode placement and routing is very important for minimizing the voltage stress on the LM2438 during an arcover event. Lastly, notice that S1 is placed very close to the red cathode and is tied directly to CRT ground.

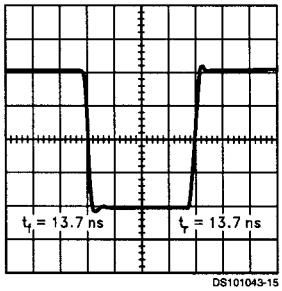


**FIGURE 10. Waveform at Cathode with LM1279/243X Demo Board**



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9. On Screen Display

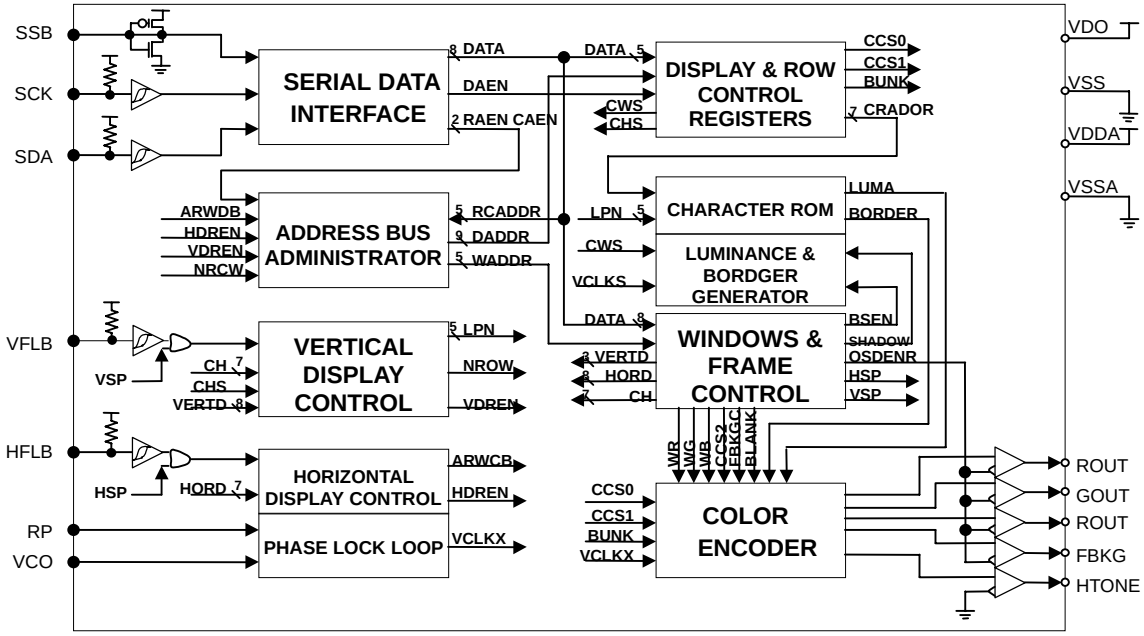
## FEATURES

- Horizontal sync input may be up to 100 kHz.
- On-chip PLL circuitry up to 90MHz pixel rate for multi-sync operation.
- Programmable horizontal resolutions up to 1524 dots per display row.
- 538 bytes display registers to control full screen display.
- Full screen display consists of 10 (rows) by 24 (columns) characters.
- 12 × 18 dot matrix per character.
- 128 built-in characters and graphic symbols and character by character color selection.
- Maximum 8 color selectable per display row.
- Double character height and/or width control.
- Programmable positioning for display screen center.
- Bordering and shadowing effect for display.
- Programmable vertical character height (18 to 71 lines) for multi-sync operation.
- 4 programmable background windows with multi-level windowing effect.
- Software clear function for display frame buffer.
- Hsync and Vsync input polarity selectable.
- Auto detection for input edge distortion between Hsync and Vsync inputs.
- Half tone and fast blanking output.
- Software force blank function for display frame.
- Compatible with both SPI bus and I²C interface through pin selection.
- 16 pins PDIP package.

## GENERAL DESCRIPTION

MTV016 is designed for use in monitor applications to display the built-in characters or symbols onto monitor screen. The display operation is by transferring data and control information in micro controller to RAM through a serial data interface. It can execute full screen display automatically and specific functions such as character bordering, shadowing, double height and width, font by font color control, frame positioning, frame size control by character height and horizontal display resolution, and windowing effect.

## BLOCK DIAGRAM



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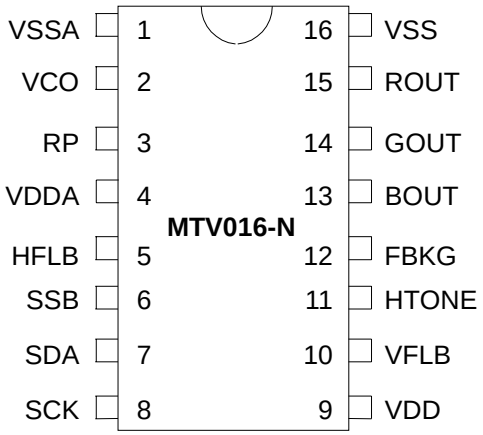
## 1.0 CONNECTION DIAGRAM

(16 PINS PDIP 300 MIL PACKAGE)




## 2.0 PIN DESCRIPTIONS

| Name | I/O | Pin# | Function |
|---|---|---|---|
| VSSA | - | 1 | **Analog ground.** This ground pin is used to internal analog circuitry. |
| VCO | I/O | 2 | **Voltage Control Oscillator.** This pin is used to control the internal oscillator frequency by DC voltage input from external low pass filter. |
| RP | I/O | 3 | **Bias Resistor.** The bias resistor is used to regulate the appropriate bias current for internal oscillator to resonate at specific dot frequency. |
| VDDA | - | 4 | **Analog power supply.** Positive 5 V DC supply for internal analog circuitry. And a 0.1uF decoupling capacitor should be connected across to VDDA and VSSA. |
| HFLB | I | 5 | **Horizontal input.** This pin is used to input the horizontal synchronizing signal. It has an internal 100 kΩ pull-up resistor. |
| SSB | I | 6 | **Serial interface enable.** It is used to enable the serial data interface and is also used to select I²C or SPI bus operation. If this pin is left floating, I²C bus is enable. Otherwise the SPI bus is enabled. |
| SDA | I | 7 | **Serial data input.** The external data transfer through this pin to internal display registers and control registers. It has an internal 100 kΩ pull-up resistor. |
| SCK | I | 8 | **Serial clock input.** The clock input pin is used to synchronize the data transfer. It has an internal 100 kΩ pull-up resistor. |
| VDD | - | 9 | **Digital power supply.** Positive 5 V DC supply for internal digital circuitry and a 0.1uF decoupling capacitor should be connected across to VDD and VSS. |
| VFLB | I | 10 | **Vertical input.** This pin is used to input the vertical synchronizing signal. It has an internal pull-up resistor. |
| HTONE | O | 11 | **Half tone output.** This pin is used to attenuate the external R, G, B amplifiers gain for the transparent windowing effect. |
| FBKG | O | 12 | **Fast Blanking output.** It is used to cut off the external R, G, B signals while this chip is displaying characters or windows. |
| BOUT | O | 13 | **Blue color output.** It is a blue color video signal output. |
| GOUT | O | 14 | **Green color output.** It is a green color video signal output. |
| ROUT | O | 15 | **Red color output.** It is a red color video signal output. |
| VSS | - | 16 | **Digital ground.** This ground pin of internal digital circuitry. |



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# Replacement Parts List

1) MultiSync 75F-3

The components specified for Model MS75F-3 Orion CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | CRT & TUNER *** | | |
| CRT | | | 80013331 | CRT 17" ORION M41QEC200X021 |
| *** | | ICS *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | | TRANSISTOR *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | EFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPN KSC 2328A TO-92(T) (SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O305 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | O317 | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | TRANSFORMERS *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80013361 | N1701F D.F X'FM EI-19(1:9) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | | VARIABLE RESISTORS *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | | RELAYS & SWITCHES *** | | |
| RL101 | | | 80003751 | RELAY 12V 6P GSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D 400ohm (GOOD SKY) |
| SW101 | | | 80012411 | SW POWER 30V/0.3A JPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | | COILS & FILTERS *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100uH 8X10 |
| L303 | | | 80015701 | CHOKE COIL 120uH 18X20 + BASE |
| L304 | | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2,G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80005311 | LINEARITY CHOKE 30uH |
| L307 | | | 80015691 | N1701F LINEARITY COIL FOR ORION |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | | PWB ASSYS *** | | |
| | | | 7C0215MO | CRT BOARD ASSY |
| | | | 7M0215MO | MAIN BOARD ASSY |
| *** | | ELECTRICAL PARTS & MISCELLANEOUS PARTS *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |
| DEGUESSING COIL | | | 80015641 | MS75F-3 TCO DEGAUSSING |
| POWER CORD | | | 80001651 | POWER CORD 3P 1.8M EUROPE |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | DIODES *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2 (HITACHI) |
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2 (HITACHI) |
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | APPEARANCE PARTS *** | | |
| | | | 10100924 | CABINET BACK(PC+ABS) |
| | | | 10101482 | CABINET FRONT ASSY(PC+ABS) |
| | | | 10101491 | CABINET FRONT(PC+ABS) |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| *** | | PRINTED & PACKING MATERIALS *** | | |
| | | | 13201142 | CARTON BOX MS75F-1(B Ver.) |
| | | | 19700025 | INSTRUCTION CD-ROM MS75/95F-1 |
| | | | 15000962 | NAME PLATE INSTRUCTION MS75F-1(B Ver.) |
| | | | 15500724 | OWNERS MANUAL MS75F/95F-1(B Ver.) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | | RESISTORS *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |



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| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R278 R280 R290 R30X | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R116 R30T | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 R286 | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 R350 | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R30H R30J | FA240474 | CARBON 1/4W(T) 5% 470Kohm |
| R107 | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R322 | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 R338 R708 R714 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R703 | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 R168 R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 R340 R373 R375 | | |
| R202 R203 R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 R221 R241 | | |
| R261 R306 R30N | | |
| R30Y R31X R331 | | |
| R332 R706 R707 | | |
| R724 R727 R742 | | |
| R743 R761 R762 | | |
| R110 R122 R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 R288 R293 | | |
| R307 R30M R30Q | | |
| R310 R318 R330 | | |
| R345 R360 R368 | | |
| R369 R377 R379 | | |
| R601 R604 R612 | | |
| R613 R709 R720 R736 | | |
| R317 | FA040106 | CARBON 1/8W(T) 5% 10Mohm |
| R353 | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 R357 | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 R123 R132 R289 R301 R401 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |
| R603 | | |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R386 | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R319 | FA040683 | CARBON 1/8W(T) 5% 68Kohm |
| R201 | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 R382 | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 R232 R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R336 | FA040822 | CARBON 1/8W(T) 5% 8.2Kohm |
| R284 | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 R157 R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31Q | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31U | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | FB241503 | METAL 1/4W(T) 1% 150Kohm |
| R149 | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 R412 | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | FB242002 | METAL 1/4W(T) 1% 20Kohm |
| R31N | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| R31L | FB244532 | METAL 1/4W(T) 1% 45.3Kohm |
| J26 | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R348 | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R388 | FB245490 | METAL 1/4W(T) 1% 549ohm |
| R349 | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 R230 R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 R413 | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R31T | FB249312 | METAL 1/4W(T) 1% 93.1Kohm |
| R169 R313 R314 R351 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R415 | FB470119 | MOF 1W/M(A) 5% 1.1ohm |
| R128 R606 | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | FB470339 | MOF 1W/M(A) 5% 3.3ohm |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R159 R296 R315 R395 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R608 | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 R243 R263 R30C R30E R339 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R270 | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 R130 R611 R726 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R30G | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 R264 | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P R731 | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| R358 | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 R31H R31J | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R715 R721 | | |
| R219 R239 R259 R328 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R211 R231 R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |
| R213 R233 R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | FA040393 | CARBON 1/8W(T) 5% 39Kohm |
| R224 R30V | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 R129 R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 R204 R282 | | |
| R291 R383 R391 | | |
| R402 R403 R602 | | |
| R605 R610 R701 | | |
| R704 R710 R712 | | |
| R716 R717 R718 | | |
| R719 R722 R728 | | |
| R729 R730 R733 | | |
| R768 R769 R770 | | |
| R739 R740 R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 R30P R359 VR201 VR202 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| R109 R115 | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 R295 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R390 | | |
| R303 | FA040561 | CARBON 1/8W(T) 5% 560ohm |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R103 | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| *** | CAPACITORS | *** |
| C707 C708 | GB610152 | CERAMIC SL/T 100P/50V J |
| C353 | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 C706 | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 C357 | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |
| C275 C278 C287 C297 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C605 | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C334 | GB7152H3 | CERAMIC Y5P(B)/T 1500P/1KV K |
| C124 C304 | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| C272 C341 | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 C205 C267 C282 C283 C284 C346 C350 C702 C709 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C106 | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 C310 C331 | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| C112 C149 C201 C202 C203 C207 C231 C270 C280 C281 C291 C294 C299 C301 C409 C712 C724 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GAI10775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA10382 | PLASTIC MPE/A 0.01u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| C332 | | | GFD334E2 | PLASTIC MPPS/A 0.33U/400V (PILKOR) |
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J (MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GE222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| C319 | | | GED562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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The components specified for Model MS75F-3 Samsung CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | CRT & TUNER *** | | |
| CRT | | | 80013481 | CRT17"SAMAUNGM41OCJ761X172DFX |
| *** | | ICS *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | | TRANSISTOR *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | FFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPN KSC 2328A TO-92(T)(SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O305 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | O317 | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | TRANSFORMERS *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80015651 | N0701F D.F. X'FM EI-19(1:10) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | | VARIABLE RESISTORS *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | | RELAYS & SWITCHES *** | | |
| RL101 | | | 80003751 | RELAY 12V 6PGSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D400ohm(GOOD SKY) |
| SW101 | | | 80012411 | SW POWER 30V/0.3AJPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | | COILS & FILTERS *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100uH 8X10 |
| L303 | L304 | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2.G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80011061 | N0701F LINEARITY CHOKE 76uH |
| L307 | | | 80010401 | N0701F LINEARITY COIL |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | | PWB ASSYS *** | | |
| | | | 7C0215MS | CRT BOARD ASSY |
| | | | 7M0215MS | MAIN BOARD ASSY |
| *** | | ELECTRICAL PARTS & MISCELLANEOUS PARTS *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |
| DEGUESSING COIL | | | 80015641 | MS75F-3 TCO DEGAUSSING |
| POWER CORD | | | 80001651 | POWER CORD 3P 1.8M EUROPE |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | DIODES *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2(HITACHI) |
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2(HITACHI) |
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | APPEARANCE PARTS *** | | |
| | | | 10100924 | CABINET BACK(PC+ABS) |
| | | | 10101482 | CABINET FRONT ASSY(PC+ABS) |
| | | | 10101491 | CABINET FRONT(PC+ABS) |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| *** | | PRINTED & PACKING MATERIALS *** | | |
| | | | 13201142 | CARTON BOX MS75F-1(B Ver.) |
| | | | 19700025 | INSTRUCTION CD-ROM MS75/95F-1 |
| | | | 15000962 | NAME PLATE INSTRUCTION MS75F-1(B Ver.) |
| | | | 15500724 | OWNERS MANUAL MS75F/95F-1(B Ver.) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | | RESISTORS *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R278 | R280 | R290 | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R30X | | | | |
| R116 | | | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| R30T | | | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | | | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 | R286 | | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | | | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 | R350 | | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R30H | R30J | | FA240754 | CARBON 1/4W(T) 5% 750Kohm |
| R107 | | | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | | | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R322 | | | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | | | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 | R338 | R708 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R714 | | | | |
| R703 | | | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 | R168 | R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 | R340 | R373 | | |
| R375 | | | | |
| R202 | R203 | R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 | R221 | R241 | | |
| R261 | R306 | R30N | | |
| R30Y | R31X | R331 | | |
| R332 | R706 | R707 | | |
| R724 | R727 | R742 | | |
| R743 | R761 | R762 | | |
| R110 | R122 | R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 | R288 | R293 | | |
| R307 | R30M | R30Q | | |
| R310 | R318 | R330 | | |
| R345 | R360 | R368 | | |
| R369 | R377 | R379 | | |
| R601 | R604 | R612 | | |
| R613 | R709 | R720 | | |
| R736 | | | | |
| R317 | | | FA040106 | CARBON 1/8W(T) 5% 10Mohm |
| R353 | | | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 | R357 | | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | | | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 | R123 | R132 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |
| R289 | R301 | R401 | | |
| R603 | | | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R386 | | | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R319 | | | FA040124 | CARBON 1/8W(T) 5% 120Kohm |
| R201 | | | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 | R382 | | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 | R232 | R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R336 | | | FA040822 | CARBON 1/8W(T) 5% 8.2Kohm |
| R284 | | | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 | R157 | R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | | | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31Q | | | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31U | | | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | | | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | | | FB241693 | METAL 1/4W(T) 1% 169Kohm |
| R149 | | | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 | R412 | | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | | | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | | | FB242002 | METAL 1/4W(T) 1% 20Kohm |
| R31N | | | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | | | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | | | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| R388 | | | FB244300 | METAL 1/4W(T) 1% 430ohm |
| J26 | | | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | | | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R31L | | | FB245102 | METAL 1/4W(T) 1% 51Kohm |
| R348 | | | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R349 | | | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | | | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 | R230 | R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 | R413 | | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R31T | | | FB241073 | METAL 1/4W(T) 1% 107Kohm |
| R169 | R313 | R314 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R351 | | | | |
| R415 | | | FB470129 | MOF 1W/M(A) 5% 1.2ohm |
| R128 | R606 | | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | | | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | | | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | | | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | | | FB470339 | MOF 1W/M(A) 5% 3.3ohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R159 | R296 | R315 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R395 | | | | |
| R608 | | | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | | | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | | | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 | R243 | R263 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R30C | R30E | R339 | | |
| R270 | | | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 | R130 | R611 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R726 | | | | |
| R30G | | | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | | | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | | | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 | R264 | | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P | R731 | | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| R358 | | | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 | R31H | R31J | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R715 | R721 | | | |
| R219 | R239 | R259 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R328 | | | | |
| R211 | R231 | R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |
| R213 | R233 | R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | | | FA040393 | CARBON 1/8W(T) 5% 39Kohm |
| R224 | R30V | | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 | R129 | R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 | R204 | R282 | | |
| R291 | R383 | R391 | | |
| R402 | R403 | R602 | | |
| R605 | R610 | R701 | | |
| R704 | R710 | R712 | | |
| R716 | R717 | R718 | | |
| R719 | R722 | R728 | | |
| R729 | R730 | R733 | | |
| R768 | R769 | R770 | | |
| R739 | R740 | R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 | R30P | R359 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| VR201 | VR202 | | | |
| R109 | R115 | | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 | R295 | R390 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R303 | | | FA040561 | CARBON 1/8W(T) 5% 560ohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R103 | | | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | | | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | | | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | | | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | | | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | | | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | | | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | | | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | | | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | | | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | | | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | | | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | | | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | | | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| | *** | CAPACITORS | *** | |
| C707 | C708 | | GB610152 | CERAMIC SL/T 100P/50V J |
| C353 | | | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 | C706 | | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | | | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 | C334 | C357 | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |
| C275 | C278 | C287 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C297 | | | | |
| C605 | | | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | | | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C124 | C304 | | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| C272 | C341 | | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | | | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 | C205 | C267 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C282 | C283 | C284 | | |
| C346 | C350 | C702 | | |
| C709 | | | | |
| C106 | | | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 | C310 | C331 | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| C112 | C149 | C201 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |
| C202 | C203 | C207 | | |
| C231 | C270 | C280 | | |
| C281 | C291 | C294 | | |
| C299 | C301 | C409 | | |
| C712 | C724 | | | |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GA110775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA22382 | PLASTIC MPE/A 0.022u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| C332 | | | GFD334E2 | PLASTIC MPPS/A 0.33U/400V (PILKOR) |
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J (MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GE222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| C319 | | | GED562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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The components specified for Model MS75F-3 LG CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | CRT & TUNER *** | | |
| CRT | | | 80013321 | CRT 17" LG M41QEE903X03 |
| *** | | ICS *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | | TRANSISTOR *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | FFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPN KSC 2328A TO-92(T) (SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O305 | | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O317 | | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | TRANSFORMERS *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80013361 | N1701F D.F X'FM EI-19(1:9) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | | VARIABLE RESISTORS *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | | RELAYS & SWITCHES *** | | |
| RL101 | | | 80003751 | RELAY 12V 6P GSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D400ohm(GOOD SKY) |
| SW101 | | | 80012411 | SW POWER 30V/0.3AJPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | | COILS & FILTERS *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100Uh 8X10 |
| L303 | L304 | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2.G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80015151 | N0701F LINEARITY CHOKE 130uH |
| L307 | | | 80010401 | N0701F LINEARITY COIL |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | | PWB ASSYS *** | | |
| | | | 7C0215ML | CRT BOARD ASSY |
| | | | 7M0215ML | MAIN BOARD ASSY |
| *** | | ELECTRICAL PARTS & MISCELLANEOUS PARTS *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |
| DEGUESSING COIL | | | 80015641 | MS75F-3 TCO DEGAUSSING |
| POWER CORD | | | 80001651 | POWER CORD 3P 1.8M EUROPE |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | DIODES *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2(HITACHI) |
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2(HITACHI) |
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | | APPEARANCE PARTS *** | | |
| | | | 10100924 | CABINET BACK(PC+ABS) |
| | | | 10101482 | CABINET FRONT ASSY(PC+ABS) |
| | | | 10101491 | CABINET FRONT(PC+ABS) |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| *** | | PRINTED & PACKING MATERIALS *** | | |
| | | | 13201142 | CARTON BOX MS75F-1(B Ver.) |
| | | | 19700025 | INSTRUCTION CD-ROM MS75/95F-1 |
| | | | 15000962 | NAME PLATE INSTRUCTION MS75F-1(B Ver.) |
| | | | 15500724 | OWNERS MANUAL MS75F/95F-1(B Ver.) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | | RESISTORS *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |



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| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R278 R280 R290 R30X | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R116 R30T | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 R286 | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 R350 | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R30H R30J | FA240754 | CARBON 1/4W(T) 5% 750Kohm |
| R107 | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R322 | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 R338 R714 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R703 | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 R168 R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 R340 R373 R375 | | |
| R202 R203 R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 R221 R241 R261 R306 R30N R30Y R31X R331 R332 R706 R707 R724 R727 R742 R743 R761 R762 | | |
| R110 R122 R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 R288 R293 R307 R30M R30Q R310 R318 R330 R345 R360 R368 R369 R377 R379 R601 R604 R612 R613 R709 R720 R736 | | |
| R317 | FA040106 | CARBON 1/8W(T) 5% 10Mohm |
| R353 | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 R357 | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 R123 R132 R289 R301 R401 R603 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R386 | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R319 | FA040683 | CARBON 1/8W(T) 5% 68Kohm |
| R201 | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 R382 | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 R232 R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R284 | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 R157 R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31Q | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31U | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | FB241503 | METAL 1/4W(T) 1% 150Kohm |
| R149 | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 R412 | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | FB242002 | METAL 1/4W(T) 1% 20Kohm |
| R31N | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| R388 | FB245490 | METAL 1/4W(T) 1% 549ohm |
| J26 | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R31L | FB245102 | METAL 1/4W(T) 1% 51Kohm |
| R348 | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R349 | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 R230 R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 R413 | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R31T | FB241053 | METAL 1/4W(T) 1% 105Kohm |
| R169 R313 R314 R351 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R415 | FB470119 | MOF 1W/M(A) 5% 1.1ohm |
| R128 R606 | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | FB470339 | MOF 1W/M(A) 5% 3.3ohm |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R159 R296 R315 R395 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R608 R708 | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 R243 R263 R30C R30E R339 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R270 | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 R130 R611 R726 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R30G | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 R264 | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P R731 R358 | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 R31H R31J R715 R721 | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R219 R239 R259 R328 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R211 R231 R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |
| R213 R233 R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | FA040393 | CARBON 1/8W(T) 5% 39Kohm |
| R224 R30V | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 R129 R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 R204 R282 R291 R383 R391 R402 R403 R602 R605 R610 R701 R704 R710 R712 R716 R717 R718 R719 R722 R728 R729 R730 R733 R768 R769 R770 | | |
| R739 R740 R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 R30P R359 VR201 VR202 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| R109 R115 | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 R295 R336 R390 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R303 | FA040561 | CARBON 1/8W(T) 5% 560ohm |

| SYMBOL | PART NO | DESCRIPTION |
|---|---|---|
| R103 | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| *** CAPACITORS *** | | |
| C707 C708 | GB610152 | CERAMIC SL/T 100P/50V J |
| C353 | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 C706 | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 C334 C357 | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |
| C275 C278 C287 C297 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C605 | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C124 C304 | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| C272 C341 | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 C205 C267 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C282 C283 C284 C346 C350 C702 C709 | | |
| C106 | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 C310 C331 | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| C112 C149 C201 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |
| C202 C203 C207 C231 C270 C280 C281 C291 C294 C299 C301 C409 C712 C724 | | |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GAI10775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA10382 | PLASTIC MPE/A 0.01u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| C332 | | | GFD304E2 | PLASTIC MPPS/A 0.3u/400V J (PILKOR) |
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J (MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GF222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| C319 | | | GFD562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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The components specified for Model AS75F-3 ORION CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | CRT & TUNER | *** | | |
| CRT | | | 80013331 | CRT 17" ORION M41QEC200XX021 |
| *** | ICS | *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | TRANSISTOR | *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | EFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPNKSC2328ATO-92(T)(SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | O305 | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | O317 | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | DIODES | *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2(HITACHI) |
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2(HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |
| *** | TRANSFORMERS | *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80013361 | N1701F D.F X'FM EI-19(1:9) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | VARIABLE RESISTORS | *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | RELAYS & SWITCHES | *** | | |
| RL101 | | | 80003751 | RELAY 12V 6P GSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D400ohm(GOOD SKY) |
| SW101 | | | 80012411 | SW POWER30V/0.3A JPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | COILS & FILTERS | *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100uH 8X10 |
| L303 | | | 80015701 | CHOKE COIL 120uH 18X20 + BASE |
| L304 | | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2.G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80005311 | LINEARITY CHOKE 30uH |
| L307 | | | 80015691 | N1701F LINEARITY FOR ORION CRT |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | PWB ASSYS | *** | | |
| | | | 7C0215MO | CRT BOARD ASSY |
| | | | 7M0216MO | MAIN BOARD ASSY |
| *** | ELECTRICAL PARTS & MISCELLANEOUS PARTS | *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| DEGUESSING COIL | | | 80010551 | 17" N0701F MPRII DEGAUSSING |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| POWER CORD | | | 80001631 | POWER CORD 3P1.8 NON-SHIELDCOLORSG8508 |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |
| *** | APPEARANCE PARTS | *** | | |
| | | | 10100594 | CABINET BACK |
| | | | 10101341 | CABINET FRONT |
| | | | 10101332 | CABINET FRONT ASSY |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000362 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| | | | 11000262 | REVOLVING STAND(T)(94HB) |
| *** | PRINTED & PACKING MATERIALS | *** | | |
| | | | 13201101 | CARTON BOX (AS75F-1) |
| B/C LABEL | | | 15000971 | NAME PLATE INSTRUCTION (AS75F-1) |
| | | | 15500712 | OWNERS MANUAL (AS75F-3) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | RESISTORS | *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |
| R278 | R280 | R290 | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R30X | | | | |
| R116 | | | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| R30T | | | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | | | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 | R286 | | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | | | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 | R350 | | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R30H | R30J | | FA240474 | CARBON 1/4W(T) 5% 470Kohm |
| R107 | | | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | | | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R322 | | | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | | | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 | R338 | R708 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R714 | | | | |
| R703 | | | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 | R168 | R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 | R340 | R373 | | |
| R375 | | | | |
| R202 | R203 | R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 | R221 | R241 | | |
| R261 | R306 | R30N | | |
| R30Y | R31X | R331 | | |
| R332 | R706 | R707 | | |
| R724 | R727 | R742 | | |
| R743 | R761 | R762 | | |
| R317 | | | FA040106 | CARBON 1/8W(T) 5% 10Mohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R224 | R30V | | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 | R129 | R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 | R204 | R282 | | |
| R291 | R383 | R391 | | |
| R402 | R403 | R602 | | |
| R605 | R610 | R701 | | |
| R704 | R710 | R712 | | |
| R716 | R717 | R718 | | |
| R719 | R722 | R728 | | |
| R729 | R730 | R733 | | |
| R768 | R769 | R770 | | |
| R739 | R740 | R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 | R30P | R359 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| VR201 | VR202 | | | |
| R109 | R115 | | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 | R295 | R390 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R303 | | | FA040561 | CARBON 1/8W(T) 5% 560ohm |
| R386 | | | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R319 | | | FA040683 | CARBON 1/8W(T) 5% 68Kohm |
| R201 | | | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 | R382 | | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 | R232 | R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R336 | | | FA040822 | CARBON 1/8W(T) 5% 8.2Kohm |
| R284 | | | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 | R157 | R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | | | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31O | | | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31U | | | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | | | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | | | FB241503 | METAL 1/4W(T) 1% 150Kohm |
| R149 | | | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 | R412 | | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | | | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | | | FB242002 | METAL 1/4W(T) 1% 20Kohm |
| R31N | | | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | | | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | | | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| R31L | | | FB244532 | METAL 1/4W(T) 1% 45.3Kohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R110 | R122 | R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 | R288 | R293 | | |
| R307 | R30M | R30O | | |
| R310 | R318 | R330 | | |
| R345 | R360 | R368 | | |
| R369 | R377 | R379 | | |
| R601 | R604 | R612 | | |
| R613 | R709 | R720 | | |
| R736 | | | | |
| R353 | | | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 | R357 | | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | | | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 | R123 | R132 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |
| R289 | R301 | R401 | | |
| R603 | | | | |
| R159 | R296 | R315 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R395 | | | | |
| R608 | | | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | | | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | | | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 | R243 | R263 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R30C | R30E | R339 | | |
| R270 | | | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 | R130 | R611 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R726 | | | | |
| R30G | | | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | | | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | | | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 | R264 | | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P | R731 | | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| R358 | | | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 | R31H | R31J | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R715 | R721 | | | |
| R219 | R239 | R259 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R328 | | | | |
| R211 | R231 | R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |
| R213 | R233 | R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | | | FA040393 | CARBON 1/8W(T) 5% 39Kohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| J26 | | | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | | | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R348 | | | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R388 | | | FB245490 | METAL 1/4W(T) 1% 549ohm |
| R349 | | | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | | | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 | R230 | R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 | R413 | | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R31T | | | FB249312 | METAL 1/4W(T) 1% 93.1Kohm |
| R169 | R313 | R314 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R351 | | | | |
| R415 | | | FB470119 | MOF 1W/M(A) 5% 1.1ohm |
| R128 | R606 | | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | | | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | | | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | | | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | | | FB470339 | MOF 1W/M(A) 5% 3.3ohm |
| R103 | | | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | | | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | | | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | | | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | | | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | | | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | | | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | | | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | | | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | | | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | | | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | | | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | | | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | | | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| | *** | CAPACITORS | *** | |
| C707 | C708 | | GB610152 | CERAMIC SL/T 100P/50V J |
| C353 | | | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 | C706 | | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | | | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 | C357 | | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C275 | C278 | C287 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C297 | | | | |
| C605 | | | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | | | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C334 | | | GB7152H3 | CERAMIC Y5P(B)/T 1500P/1KV K |
| C124 | C304 | | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| | | | | |
| C272 | C341 | | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | | | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 | C205 | C267 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C282 | C283 | C284 | | |
| C346 | C350 | C702 | | |
| C709 | | | | |
| C106 | | | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 | | | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| | | | | |
| C310 | C331 | | GB9103F8 | CERAMIC Z5V(F)/T 0.01u/500V Z |
| C112 | C149 | C201 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |
| C202 | C203 | C207 | | |
| C231 | C270 | C280 | | |
| C281 | C291 | C294 | | |
| C299 | C301 | C409 | | |
| C712 | C724 | | | |
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GAI10775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| | | | | |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| | | | | |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| | | | | |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| | | | | |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| | | | | |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| | | | | |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA10382 | PLASTIC MPE/A 0.01u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| | | | | |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| | | | | |
| C332 | | | GFD334E2 | PLASTIC MPPS/A 0.33U/400V (PILKOR) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J(MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GE222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| | | | | |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| | | | | |
| C319 | | | GED562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| | | | | |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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The components specified for Model AS75F-3 SAMSUNG CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | CRT & TUNER | *** | | |
| CRT | | | 80013481 | CRT 17" SAMSUNG M41QCJ761X172 DFX |
| *** | ICS | *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | TRANSISTOR | *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | EFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPN KSC 2328A TO-92 (T) (SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | O305 | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | O317 | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | DIODES | *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2(HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2(HITACHI) |
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |
| *** | TRANSFORMERS | *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80015651 | N0701F D.F. X'FM EI-19(1:10) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | VARIABLE RESISTORS | *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | RELAYS & SWITCHES | *** | | |
| RL101 | | | 80003751 | RELAY 12V 6P GSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D400ohm(GOOD SKY) |
| SW101 | | | 80012411 | SW POWER30V/0.3A JPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | COILS & FILTERS | *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100uH 8X10 |
| L303 | L304 | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2.G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80011061 | N0701F LIN COIL 76uH |
| L307 | | | 80010401 | N0701F LINEARITY COIL |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | PWB ASSYS | *** | | |
| | | | 7C0215MS | CRT BOARD ASSY |
| | | | 7M0216MS | MAIN BOARD ASSY |
| *** | ELECTRICAL PARTS & MISCELLANEOUS PARTS | *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| DEGUESSING COIL | | | 80010551 | 17" N0701F MPRII DEGAUSSING |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| POWER CORD | | | 80001631 | POWER CORD 3P1.8 NON-SHIELDCOLORSG8508 |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |
| *** | APPEARANCE PARTS | *** | | |
| | | | 10100594 | CABINET BACK |
| | | | 10101341 | CABINET FRONT |
| | | | 10101332 | CABINET FRONT ASSY |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000362 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| | | | 11000262 | REVOLVING STAND(T)(94HB) |
| *** | PRINTED & PACKING MATERIALS | *** | | |
| | | | 13201101 | CARTON BOX (AS75F-1) |
| B/C LABEL | | | 15000971 | NAME PLATE INSTRUCTION (AS75F-1) |
| | | | 15500712 | OWNERS MANUAL (AS75F-3) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | RESISTORS | *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |
| R278 | R280 | R290 | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R30X | | | | |
| R116 | | | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| R30T | | | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | | | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 | R286 | | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | | | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 | R350 | | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R107 | | | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | | | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R30H | R30J | | FA240754 | CARBON 1/4W(T) 5% 750Kohm |
| R322 | | | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | | | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 | R338 | R708 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R714 | | | | |
| R703 | | | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 | R168 | R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 | R340 | R373 | | |
| R375 | | | | |
| R202 | R203 | R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 | R221 | R241 | | |
| R261 | R306 | R30N | | |
| R30Y | R31X | R331 | | |
| R332 | R706 | R707 | | |
| R724 | R727 | R742 | | |
| R743 | R761 | R762 | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R211 | R231 | R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |
| R213 | R233 | R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | | | FA040393 | CARBON 1/8W(T) 5% 39Kohm |
| R224 | R30V | | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 | R129 | R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 | R204 | R282 | | |
| R291 | R383 | R391 | | |
| R402 | R403 | R602 | | |
| R605 | R610 | R701 | | |
| R704 | R710 | R712 | | |
| R716 | R717 | R718 | | |
| R719 | R722 | R728 | | |
| R729 | R730 | R733 | | |
| R768 | R769 | R770 | | |
| R739 | R740 | R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 | R30P | R359 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| VR201 | VR202 | | | |
| R109 | R115 | | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 | R295 | R390 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R303 | | | FA040561 | CARBON 1/8W(T) 5% 560ohm |
| R386 | | | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R201 | | | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 | R382 | | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 | R232 | R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R336 | | | FA040822 | CARBON 1/8W(T) 5% 8.2Kohm |
| R284 | | | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 | R157 | R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | | | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31O | | | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31T | | | FB241073 | METAL 1/4W(T) 1% 107Kohm |
| R31U | | | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | | | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | | | FB241693 | METAL 1/4W(T) 1% 169Kohm |
| R149 | | | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 | R412 | | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | | | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | | | FB242002 | METAL 1/4W(T) 1% 20Kohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R110 | R122 | R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 | R288 | R293 | | |
| R307 | R30M | R30O | | |
| R310 | R318 | R330 | | |
| R345 | R360 | R368 | | |
| R369 | R377 | R379 | | |
| R601 | R604 | R612 | | |
| R613 | R709 | R720 | | |
| R736 | | | | |
| R317 | | | FA040106 | CARBON 1/8W(T) 5% 10Mohm |
| R319 | | | FA040124 | CARBON 1/8W(T) 5% 120Kohm |
| R353 | | | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 | R357 | | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | | | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 | R123 | R132 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |
| R289 | R301 | R401 | | |
| R603 | | | | |
| R159 | R296 | R315 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R395 | | | | |
| R608 | R708 | | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | | | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | | | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 | R243 | R263 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R30C | R30E | R339 | | |
| R270 | | | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 | R130 | R611 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R726 | | | | |
| R30G | | | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | | | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | | | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 | R264 | | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P | R731 | | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| R358 | | | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 | R31H | R31J | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R715 | R721 | | | |
| R219 | R239 | R259 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R328 | | | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R31N | | | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | | | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | | | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| R388 | | | FB244300 | METAL 1/4W(T) 1% 430ohm |
| J26 | | | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | | | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R348 | | | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R31L | | | FB245102 | METAL 1/4W(T) 1% 51Kohm |
| R349 | | | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | | | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 | R230 | R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 | R413 | | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R169 | R313 | R314 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R351 | | | | |
| R415 | | | FB470129 | MOF 1W/M(A) 5% 1.2ohm |
| R128 | R606 | | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | | | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | | | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | | | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | | | FB470339 | MOF 1W/M(A) 5% 3.3ohm |
| R103 | | | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | | | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | | | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | | | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | | | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | | | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | | | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | | | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | | | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | | | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | | | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | | | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | | | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | | | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| | *** | | CAPACITORS *** | |
| C707 | C708 | | GB610152 | CERAMIC SL/T 100P/50V J |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C353 | | | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 | C706 | | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | | | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 | C334 | C357 | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |
| C275 | C278 | C287 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C297 | | | | |
| C605 | | | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | | | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C124 | C304 | | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| C272 | C341 | | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | | | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 | C205 | C267 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C282 | C283 | C284 | | |
| C346 | C350 | C702 | | |
| C709 | | | | |
| C106 | | | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 | | | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| C310 | C331 | | GB9103F8 | CERAMIC Z5V(F)/T 0.01u/500V Z |
| C112 | C149 | C201 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |
| C202 | C203 | C207 | | |
| C231 | C270 | C280 | | |
| C281 | C291 | C294 | | |
| C299 | C301 | C409 | | |
| C712 | C724 | | | |
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GAI10775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA22382 | PLASTIC MPE/A 0.022u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| C332 | | | GFD334E2 | PLASTIC MPPS/A 0.33U/400V (PILKOR) |
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J (MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GE222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| C319 | | | GED562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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The components specified for Model AS75F-3 LG CRT.

Note: The components identified by ⚠ make are critical for safety.

Replace only with parts Number specified.

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | CRT & TUNER | *** | | |
| CRT | | | 80013321 | CRT 17" LG M41QEE903X04 |
| *** | ICS | *** | | |
| U702 | | | 80009941 | ATMEL E²ROM AT24C08B |
| U101 | | | DD002600 | IC LINEAR KA3842A 8P |
| U201 | | | 80000631 | IC LM1281 |
| U103 | | | 80000321 | IC PHOTO COUBLE PS2561,TLP721F |
| O103 | | | 80003831 | IC REGULATOR TL431 817B 4P |
| U401 | | | 80001041 | IC TDA8172 (N.S,SGS) |
| U203 | | | 80003661 | N.S VIDEO DRIVE IC LM2438 |
| U701 | | | 80013001 | N0701-2 VE MASK MCU |
| U301 | | | 80010251 | OP AMP LM358 / KIA358 |
| U204 | | | 80015661 | OSD IC MTV016N (V2) |
| U302 | | | 80012941 | PHILIPS IC TDA 4857 |
| *** | TRANSISTOR | *** | | |
| O101 | | | EF202500 | FET N 2SK2545 TO-220F TOSHIBA |
| O313 | O319 | O322 | EF206301 | FET N YTAF630 TO-220F |
| O308 | | | EFA29610 | TR 2SK2961 FET TOSHIBA |
| Q201 | | | EAA12133 | TR NPN 2SC1213AC TO-92(T) |
| O105 | O107 | O110 | EAA18157 | TR NPN 2SC1815GR TO-92(T) (T.P.S.) |
| O113 | O302 | O306 | | |
| O320 | O323 | O324 | | |
| O401 | O601 | O603 | | |
| O605 | O606 | | | |
| O303 | | | EAA40020 | TR NPN 2SC4002 TO-92(T) (SANYO) |
| O307 | | | 80005721 | TR NPN 2SC5411(hfe) TO-3P |
| O321 | O327 | | EAA09456 | TR NPN 2SC945P TO-92(T) (N.P.S.) |
| O318 | | | 80008141 | TR NPN 2SD1763 TO-220F |
| O304 | | | EAA04220 | TR NPN BF422 TO-92(T) (T,P) |
| O106 | | | EAA23281 | TR NPN KSC 2328A TO-92(T) (SAMSUNG) |
| O301 | | | EAA23690 | TR NPN PH2369 TO-92(T) (PHILIPS) |
| O310 | O604 | | EBA10157 | TR PNP 2SA1015GR TO-92(T) (T.P.S.) |
| O325 | O326 | O701 | EBA07336 | TR PNP 2SA733P TO-92(T) (N.P.S.) |
| O702 | O703 | | | |
| O112 | O305 | | EBA04230 | TR PNP BF423 TO-92(T)(T.P.) |
| O108 | O317 | | EBA09281 | TR PNP KSA 928A TO-92(T)(SAMSUNG) |
| O104 | | | EB307720 | TR PNP KSB772 TO-126 |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| *** | DIODES | *** | | |
| D107 | D109 | D10A | EJ044148 | DIODE "T" 1N4148 |
| D117 | D119 | D125 | | |
| D126 | D127 | D129 | | |
| D202 | D203 | D204 | | |
| D205 | D210 | D211 | | |
| D230 | D231 | D250 | | |
| D251 | D302 | D304 | | |
| D311 | D313 | D314 | | |
| D315 | D317 | D319 | | |
| D320 | D323 | D325 | | |
| D327 | D332 | D333 | | |
| D334 | D336 | D337 | | |
| D340 | D344 | D601 | | |
| D602 | D604 | D605 | | |
| D60A | D703 | D704 | | |
| D705 | | | | |
| D112 | D113 | D118 | 80003551 | DIODE 200V/1.6A RG2Z SANKEN S |
| D110 | D335 | | 80003561 | DIODE 600V/1.6A RG2A SANKEN S |
| D308 | | | 80009541 | DIODE FAGOR FUF5406 S (A+K) |
| D305 | D306 | D702 | EJA05819 | DIODE STKY/T 1A/40V 1N5819 |
| D101 | D102 | D103 | EJB20001 | DIODE/A 3A 1N5406 |
| D104 | | | | |
| D111 | | | 80011291 | DIODE/A 3A/400V RG4( ) |
| D307 | | | 80001171 | DIODE/A 5TUZ47C (TOSHIBA) |
| D316 | | | 80009261 | DIODE/A RP3F(A+K) SANKEN |
| D213 | D214 | D233 | 80000451 | DIODE/T 1/2W 1SS83 |
| D234 | D253 | D254 | | |
| D106 | D108 | D131 | EJAC0017 | DIODE/T 1A 1N4936 |
| D303 | D310 | D345 | | |
| D701 | | | | |
| D201 | D301 | D312 | EJAC0018 | DIODE/T 1A 1N4937 |
| D318 | D321 | D322 | | |
| D324 | D328 | D329 | | |
| D330 | D331 | D341 | | |
| D403 | | | | |
| D105 | D116 | D326 | EJA20003 | DIODE/T 1A BA159 |
| LED701 | | | 80000131 | LED L-59GH/1GYC |
| ZD104 | | | EKA00603 | ZEN DIODE 1/2W(T) 6B1 (HITACHI) |
| ZD101 | | | EKA0180B | ZEN DIODE 1/2W(T) HZS 18-2(HITACHI) |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| ZD102 | | | EKA01201 | ZEN DIODE 1/2W(T) HZS12A2(HITACHI) |
| ZD303 | ZD701 | ZD702 | EKA00507 | ZEN DIODE 1/2W(T) HZS5C2 (HITACHI) |
| ZD703 | ZD704 | | | |
| ZD706 | | | EKA00607 | ZEN DIODE 1/2W(T) HZS6C2 (HITACHI) |
| *** | TRANSFORMERS | *** | | |
| T301 | | | 80009281 | 17" N0701F FBT |
| T302 | | | 80000281 | H.DRIVE X'FM 4.5mH EI-19 |
| T303 | | | 80013361 | N1701F D.F X'FM EI-19(1:9) |
| T101 | | | 80011211 | POWER X'FM ERL35 500uH FE700+ |
| *** | VARIABLE RESISTORS | *** | | |
| VR101 | | | FF300201 | VR CARBON 6mm 200 ohm/B |
| VR210 | VR230 | VR250 | FF300203 | VR CARBON 6mm 20K/B |
| VR307 | | | FF310104 | VR CARBON 6mm 100K |
| *** | RELAYS & SWITCHES | *** | | |
| RL101 | | | 80003751 | RELAY 12V 6P GSA-SS-212DM(GOOD-SKY) |
| RL301 | | | 80010001 | RELAY RUDH-SH-112D400ohm(GOOD SKY) |
| SW101 | | | 80012411 | SW POWER 30V/0.3AJPS1258DS(Favortron) |
| SW701 | SW702 | SW703 | 80000251 | TACT SW 1P 100G+-50 |
| SW301 | | | 80010621 | WAFER 2L×3P 2.54mm |
| *** | COILS & FILTERS | *** | | |
| L201 | L202 | | HB000008 | CHOKE COIL 100uH 8X10 |
| L303 | L304 | | 80001811 | CHOKE COIL 130uH 18X20 + BASE |
| L103 | | | 80003681 | CHOKE T50-26B 200uH |
| G2.G4 WIRE | | | HA030010 | EMI FILTER COIL 20.45X10.2X10 |
| L301 | | | 80009291 | H-CENTER CHOKE |
| L101 | | | 80000111 | LINE FILTER ET24 10mH MIN |
| L102 | | | HB000015 | LINE FILTER UU10.5 1mH |
| L302 | | | 80015151 | N0701F LINEARITY CHOKE 130uH |
| L307 | | | 80010401 | N0701F LINEARITY COIL |
| L203 | L204 | L205 | HB013159 | PACKING COIL /T 1.5uH K(EC24) |
| J23 | | | HB013100 | PACKING COIL /T 10uH K(EC24) |
| *** | PWB ASSYS | *** | | |
| | | | 7C0215ML | CRT BOARD ASSY |
| | | | 7M0216ML | MAIN BOARD ASSY |
| *** | ELECTRICAL PARTS & MISCELLANEOUS PARTS | *** | | |
| SOCKET | | | 80001751 | 17" 29D NECK CRT SOCKET |
| DEGUESSING COIL | | | 80010551 | 17" N0701F MPRII DEGAUSSING |
| P101 | | | JD512001 | AC SOCKET 3P |
| F101 | | | 80001521 | FUSE 3.15A/250V 50T T3.15A |
| FOR U701 | | | JD010040 | IC SOCKET 40P |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| POWER CORD | | | 80001631 | POWER CORD 3P 1.8 NON-SHIELD COLOR SG8508 |
| CABLE | | | 80012051 | SIGNAL CABLE 20276 1.5M FOR PC+5V |
| TH101 | | | 80000801 | THERMISTOR NTCR SCK054 13.3mm |
| TH102 | | | 80005821 | THERMISTOR PTCR 4.5ohm |
| X701 | | | EM012004 | X'TAL 49U 12MHz |
| *** | APPEARANCE PARTS | *** | | |
| | | | 10100594 | CABINET BACK |
| | | | 10101341 | CABINET FRONT |
| | | | 10101332 | CABINET FRONT ASSY |
| | | | 17000301 | CUSHION PIECE(BACK) |
| | | | 17000291 | CUSHION SHEET |
| | | | 17000451 | CUSHION SHEET |
| | | | 11000331 | REVOLVING STAND ASSY |
| | | | 11000251 | REVOLVING STAND(B)(94HB) |
| | | | 11000361 | REVOLVING STAND(B)(94HB) |
| | | | 11000362 | REVOLVING STAND(B)(94HB) |
| | | | 11000261 | REVOLVING STAND(T)(94HB) |
| | | | 11000262 | REVOLVING STAND(T)(94HB) |
| *** | PRINTED & PACKING MATERIALS | *** | | |
| | | | 13201101 | CARTON BOX (AS75F-1) |
| B/C LABEL | | | 15000971 | NAME PLATE INSTRUCTION (AS75F-1) |
| | | | 15500712 | OWNERS MANUAL (AS75F-3) |
| | | | 13400521 | POLYLON(B)CARTON |
| | | | 13400511 | POLYLON(T)CARTON |
| *** | RESISTORS | *** | | |
| R156 | | | FA330159 | CARBON 1/2W(T) 5% 1.5ohm |
| R325 | | | FA330182 | CARBON 1/2W(T) 5% 1.8Kohm |
| R114 | R120 | | FA330104 | CARBON 1/2W(T) 5% 100Kohm |
| R287 | | | FA330101 | CARBON 1/2W(T) 5% 100ohm |
| R365 | | | FA330154 | CARBON 1/2W(T) 5% 150Kohm |
| R385 | | | FA330150 | CARBON 1/2W(T) 5% 15ohm |
| R182 | | | FA330102 | CARBON 1/2W(T) 5% 1Kohm |
| R367 | R380 | R381 | FA330105 | CARBON 1/2W(T) 5% 1Mohm |
| R417 | | | FA330229 | CARBON 1/2W(T) 5% 2.2ohm |
| R414 | | | FA330331 | CARBON 1/2W(T) 5% 330ohm |
| R30L | | | FA330470 | CARBON 1/2W(T) 5% 47ohm |
| R308 | | | FA330561 | CARBON 1/2W(T) 5% 560ohm |
| R101 | | | FA330684 | CARBON 1/2W(T) 5% 680Kohm |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R292 | | | FA240101 | CARBON 1/4W(T) 5% 100ohm |
| R206 | R725 | | FA240103 | CARBON 1/4W(T) 5% 10Kohm |
| R10A | R31F | | FA240113 | CARBON 1/4W(T) 5% 11Kohm |
| R392 | | | FA240154 | CARBON 1/4W(T) 5% 150Kohm |
| R220 | R240 | R260 | FA240151 | CARBON 1/4W(T) 5% 150ohm |
| R163 | R30U | R31E | FA240102 | CARBON 1/4W(T) 5% 1Kohm |
| R609 | | | FA240222 | CARBON 1/4W(T) 5% 2.2Kohm |
| R118 | | | FA240203 | CARBON 1/4W(T) 5% 20Kohm |
| R393 | | | FA240224 | CARBON 1/4W(T) 5% 220Kohm |
| R278 | R280 | R290 | FA240223 | CARBON 1/4W(T) 5% 22Kohm |
| R30X | | | | |
| R116 | | | FA240271 | CARBON 1/4W(T) 5% 270ohm |
| R30T | | | FA240332 | CARBON 1/4W(T) 5% 3.3Kohm |
| R104 | | | FA240330 | CARBON 1/4W(T) 5% 33 ohm |
| R108 | R286 | | FA240334 | CARBON 1/4W(T) 5% 330Kohm |
| R117 | | | FA240390 | CARBON 1/4W(T) 5% 39ohm |
| R343 | R350 | | FA240472 | CARBON 1/4W(T) 5% 4.7Kohm |
| R107 | | | FA240564 | CARBON 1/4W(T) 5% 560Kohm |
| R126 | | | FA240681 | CARBON 1/4W(T) 5% 680ohm |
| R30H | R30J | | FA240754 | CARBON 1/4W(T) 5% 750Kohm |
| R322 | | | FA040122 | CARBON 1/8W(T) 5% 1.2Kohm |
| R387 | | | FA040132 | CARBON 1/8W(T) 5% 1.3Kohm |
| R205 | R338 | R714 | FA040152 | CARBON 1/8W(T) 5% 1.5Kohm |
| R703 | | | FA040182 | CARBON 1/8W(T) 5% 1.8Kohm |
| R155 | R168 | R31C | FA040104 | CARBON 1/8W(T) 5% 100Kohm |
| R327 | R340 | R373 | | |
| R375 | | | | |
| R202 | R203 | R208 | FA040101 | CARBON 1/8W(T) 5% 100ohm |
| R209 | R221 | R241 | | |
| R261 | R306 | R30N | | |
| R30Y | R31X | R331 | | |
| R332 | R706 | R707 | | |
| R724 | R727 | R742 | | |
| R743 | R761 | R762 | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R213 | R233 | R253 | FA040391 | CARBON 1/8W(T) 5% 390ohm |
| R713 | | | FA040393 | CARBON 1/8W(T) 5% 39Kohm |
| R224 | R30V | | FA040302 | CARBON 1/8W(T) 5% 3Kohm |
| R119 | R129 | R148 | FA040472 | CARBON 1/8W(T) 5% 4.7Kohm |
| R173 | R204 | R282 | | |
| R291 | R383 | R391 | | |
| R402 | R403 | R602 | | |
| R605 | R610 | R701 | | |
| R704 | R710 | R712 | | |
| R716 | R717 | R718 | | |
| R719 | R722 | R728 | | |
| R729 | R730 | R733 | | |
| R768 | R769 | R770 | | |
| R739 | R740 | R771 | FA040471 | CARBON 1/8W(T) 5% 470ohm |
| JP1 | R30P | R359 | FA040473 | CARBON 1/8W(T) 5% 47Kohm |
| VR201 | VR202 | | | |
| R109 | R115 | | FA040470 | CARBON 1/8W(T) 5% 47ohm |
| R294 | R295 | R336 | FA040562 | CARBON 1/8W(T) 5% 5.6Kohm |
| R390 | | | | #N/A |
| R303 | | | FA040561 | CARBON 1/8W(T) 5% 560ohm |
| R386 | | | FA040623 | CARBON 1/8W(T) 5% 62Kohm |
| R319 | | | FA040683 | CARBON 1/8W(T) 5% 68Kohm |
| R201 | | | FA040680 | CARBON 1/8W(T) 5% 68ohm |
| R113 | R382 | | FA040752 | CARBON 1/8W(T) 5% 7.5Kohm |
| R212 | R232 | R252 | FA040750 | CARBON 1/8W(T) 5% 75ohm |
| R284 | | | FA040821 | CARBON 1/8W(T) 5% 820ohm |
| R150 | R157 | R175 | 80002031 | FUSEABLE RES 1/2W(A)M 0.22ohm |
| R297 | | | FB910229 | FUSIBLE MF RES 1/4W 2.2ohm J |
| R31O | | | FB241181 | METAL 1/4W(T) 1% 1.18Kohm |
| R31T | | | FB241053 | METAL 1/4W(T) 1% 105K |
| R31U | | | FB241202 | METAL 1/4W(T) 1% 12Kohm |
| R389 | | | FB241372 | METAL 1/4W(T) 1% 13.7Kohm |
| R366 | | | FB241503 | METAL 1/4W(T) 1% 150Kohm |
| R149 | | | FB241001 | METAL 1/4W(T) 1% 1Kohm |
| R410 | R412 | | FB242501 | METAL 1/4W(T) 1% 2.5Kohm |
| R31R | | | FB242701 | METAL 1/4W(T) 1% 2.7Kohm |
| R361 | | | FB242002 | METAL 1/4W(T) 1% 20Kohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R110 | R122 | R161 | FA040103 | CARBON 1/8W(T) 5% 10Kohm |
| R167 | R288 | R293 | | |
| R307 | R30M | R30O | | |
| R310 | R318 | R330 | | |
| R345 | R360 | R368 | | |
| R369 | R377 | R379 | | |
| R601 | R604 | R612 | | |
| R613 | R709 | R720 | | |
| R736 | | | | |
| R317 | | | FA040106 | CARBON 1/8W(T) 5% 10Mohm |
| R353 | | | FA040154 | CARBON 1/8W(T) 5% 150Kohm |
| R154 | R357 | | FA040153 | CARBON 1/8W(T) 5% 15Kohm |
| R362 | | | FA040150 | CARBON 1/8W(T) 5% 15ohm |
| R112 | R123 | R132 | FA040102 | CARBON 1/8W(T) 5% 1Kohm |
| R289 | R301 | R401 | | |
| R603 | | | | |
| R159 | R296 | R315 | FA040105 | CARBON 1/8W(T) 5% 1Mohm |
| R395 | | | | |
| R608 | R708 | | FA040222 | CARBON 1/8W(T) 5% 2.2Kohm |
| R305 | | | FA040225 | CARBON 1/8W(T) 5% 2.2Mohm |
| R374 | | | FA040204 | CARBON 1/8W(T) 5% 200Kohm |
| R223 | R243 | R263 | FA040224 | CARBON 1/8W(T) 5% 220Kohm |
| R30C | R30E | R339 | | |
| R270 | | | FA040221 | CARBON 1/8W(T) 5% 220ohm |
| R127 | R130 | R611 | FA040223 | CARBON 1/8W(T) 5% 22Kohm |
| R726 | | | | |
| R30G | | | FA040220 | CARBON 1/8W(T) 5% 22ohm |
| R363 | | | FA040244 | CARBON 1/8W(T) 5% 240Kohm |
| R364 | | | FA040274 | CARBON 1/8W(T) 5% 270Kohm |
| R244 | R264 | | FA040202 | CARBON 1/8W(T) 5% 2Kohm |
| R31P | R731 | | FA040332 | CARBON 1/8W(T) 5% 3.3Kohm |
| R358 | | | FA040334 | CARBON 1/8W(T) 5% 330Kohm |
| R102 | R31H | R31J | FA040331 | CARBON 1/8W(T) 5% 330ohm |
| R715 | R721 | | | |
| R219 | R239 | R259 | FA040333 | CARBON 1/8W(T) 5% 33Kohm |
| R328 | | | | |
| R211 | R231 | R251 | FA040330 | CARBON 1/8W(T) 5% 33ohm |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| R31N | | | FB242202 | METAL 1/4W(T) 1% 22Kohm |
| R344 | | | FB242552 | METAL 1/4W(T) 1% 25.5Kohm |
| R711 | | | FB243481 | METAL 1/4W(T) 1% 3.48Kohm |
| J26 | | | FB244702 | METAL 1/4W(T) 1% 47Kohm |
| R158 | | | FB240470 | METAL 1/4W(T) 1% 47ohm |
| R348 | | | FB245541 | METAL 1/4W(T) 1% 5.54Kohm |
| R31L | | | FB245102 | METAL 1/4W(T) 1% 51Kohm |
| R388 | | | FB245490 | METAL 1/4W(T) 1% 549ohm |
| R349 | | | FB245602 | METAL 1/4W(T) 1% 56Kohm |
| R151 | | | FB246242 | METAL 1/4W(T) 1% 62.4Kohm |
| R210 | R230 | R250 | FB247509 | METAL 1/4W(T) 1% 75ohm |
| R411 | R413 | | FB248201 | METAL 1/4W(T) 1% 8.2Kohm |
| R169 | R313 | R314 | FB910010 | METAL 1/4W(T) 5% 1ohm |
| R351 | | | | |
| R415 | | | FB470119 | MOF 1W/M(A) 5% 1.1ohm |
| R128 | R606 | | FB470100 | MOF 1W/M(A) 5% 10ohm |
| R160 | | | FB470153 | MOF 1W/M(A) 5% 15Kohm |
| R421 | | | FB470109 | MOF 1W/M(A) 5% 1ohm |
| R312 | | | FB470270 | MOF 1W/M(A) 5% 27ohm |
| R422 | | | FB470339 | MOF 1W/M(A) 5% 3.3ohm |
| R103 | | | FB470680 | MOF 1W/M(A) 5% 68ohm |
| R31A | | | FB480100 | MOF 1W/M(B) 5% 10ohm |
| R105 | | | FB560248 | MOF 2W/M(A) 5% 0.24ohm |
| R354 | | | FB560182 | MOF 2W/M(A) 5% 1.8Kohm |
| R125 | | | FB560103 | MOF 2W/M(A) 5% 10Kohm |
| R335 | | | FB560151 | MOF 2W/M(A) 5% 150ohm |
| R302 | | | FB560222 | MOF 2W/M(A) 5% 2.2Kohm |
| R316 | | | FB560331 | MOF 2W/M(A) 5% 330ohm |
| R106 | | | FB570563 | MOF 2W/M(B) 5% 56Kohm |
| R309 | | | FB710150 | MOF 3W/M(A) 5% 15ohm |
| R311 | | | FB710109 | MOF 3W/M(A) 5% 1ohm |
| R304 | | | 80011181 | RESISTOR FUSEABLE 1/2W/A(M) 22ohm |
| R394 | | | FC030508 | WOUND RES 1W/(A) 5% 0.5ohm |
| R111 | | | FC110158 | WOUND RES 2W(A) 5% 0.15ohm |
| | *** | CAPACITORS | *** | |
| C707 | C708 | | GB610152 | CERAMIC SL/T 100P/50V J |



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| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C353 | | | GB633152 | CERAMIC SL/T 330P/50V J |
| C705 | C706 | | GB633052 | CERAMIC SL/T 33P/50V J |
| SG301 | | | 80011281 | CERAMIC SPARK CAPS 1KV +1500V~900V |
| C276 | C334 | C357 | GB7102H3 | CERAMIC Y5P(B)/T 1000P/1KV K |
| C275 | C278 | C287 | GB7102F3 | CERAMIC Y5P(B)/T 1000P/500V K |
| C297 | | | | |
| C605 | | | GB710253 | CERAMIC Y5P(B)/T 1000P/50V K |
| C127 | | | GB7101H3 | CERAMIC Y5P(B)/T 100P/1KV K |
| C124 | C304 | | GB7331H3 | CERAMIC Y5P(B)/T 330P/1KV K |
| C272 | C341 | | GB7471F3 | CERAMIC Y5P(B)/T 470P/500V K |
| C110 | | | GB747153 | CERAMIC Y5P(B)/T 470P/50V K |
| C204 | C205 | C267 | GB210458 | CERAMIC Y5V/T 0.1u/50V Z |
| C282 | C283 | C284 | | |
| C346 | C350 | C702 | | |
| C709 | | | | |
| C106 | | | GB8103F5 | CERAMIC Z5U(E)/T 0.01u/500V M |
| C321 | | | GB9103H8 | CERAMIC Z5V(F)/T 0.01u/1KV Z |
| C310 | C331 | | GB9103F8 | CERAMIC Z5V(F)/T 0.01u/500V Z |
| C112 | C149 | C201 | GB910358 | CERAMIC Z5V(F)/T 0.01u/50V Z |
| C202 | C203 | C207 | | |
| C231 | C270 | C280 | | |
| C281 | C291 | C294 | | |
| C299 | C301 | C409 | | |
| C712 | C724 | | | |
| C277 | | | GB9332H8 | CERAMIC Z5V(F)/T 3300P/1KV Z |
| C120 | C138 | | GAI10775 | ELECT 105oC/A 100u/100V M TK |
| C214 | C234 | C254 | GA210575 | ELECT 105oC/T 1u/100V M |
| C288 | | | GAB22675 | ELECT 105oC/T 22u/100V M |
| C428 | | | GA347485 | ELECT 85oC/T 0.47u/250V M |
| C122 | | | GA310815 | ELECT 85oC/T 1000u/10V M |
| C372 | C703 | | GA310725 | ELECT 85oC/T 100u/16V M |
| C308 | C410 | | GA310745 | ELECT 85oC/T 100u/35V M |
| C113 | C116 | C143 | GA310655 | ELECT 85oC/T 10u/50V M |
| C150 | C206 | C210 | | |
| C230 | C250 | C292 | | |
| C293 | C337 | C338 | | |
| C604 | C711 | C726 | | |
| C727 | C728 | | | |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C336 | C340 | C352 | GA310555 | ELECT 85oC/T 1u/50V M |
| C701 | C710 | | | |
| C339 | C704 | | GA322555 | ELECT 85oC/T 2.2u/50V M |
| C209 | | | GA322725 | ELECT 85oC/T 220u/16V M |
| C109 | | | GA322645 | ELECT 85oC/T 22u/35V M |
| C311 | | | GA322655 | ELECT 85oC/T 22u/50V M |
| C344 | | | GA347585 | ELECT 85oC/T 4.7u/250V M |
| C309 | | | GA347555 | ELECT 85oC/T 4.7u/50V M |
| C136 | C330 | | GA347725 | ELECT 85oC/T 470u/16V M |
| C108 | C137 | C151 | GA347625 | ELECT 85oC/T 47u/16V M |
| C285 | C289 | C335 | | |
| C725 | | | | |
| C368 | | | GA347635 | ELECT 85oC/T 47u/25V M |
| C354 | | | GA347645 | ELECT 85oC/T 47u/35V M |
| C313 | | | GA347655 | ELECT 85oC/T 47u/50V M |
| C121 | C408 | | GAH10825 | ELECT CAP 105oC/T 1000u/16V M TK |
| C119 | | | GAH22675 | ELECT CAP 105oC/T 22u/100V M TK |
| C156 | | | GAH47555 | ELECT CAP 105oC/T 4.7u/50V M TK |
| C139 | C404 | | GAH47725 | ELECT CAP 105oC/T 470u/16V M TK |
| C213 | C233 | C253 | GA410575 | ELECT NP/T 1u/100V M |
| C312 | | | GF215252 | MEF CAP BOX 0.0015u/50V J |
| C315 | | | GF210252 | MEF CAP BOX 0.001u/50V J |
| C115 | | | GF233262 | MEF CAP BOX 0.0033u/63V J |
| C366 | | | GF256252 | MEF CAP BOX 0.0056u/50V J |
| C362 | | | GF282252 | MEF CAP BOX 0.0082u/50V J |
| C365 | | | GF210352 | MEF CAP BOX 0.01u/50V J |
| C360 | | | GF215452 | MEF CAP BOX 0.15u/50V J |
| C314 | | | GF210452 | MEF CAP BOX 0.1u/50V J |
| C114 | | | GF210462 | MEF CAP BOX 0.1u/63V J |
| C403 | | | GF222452 | MEF CAP BOX 0.22u/50V J |
| C345 | | | GFA10382 | PLASTIC MPE/A 0.01u/250V J |
| C329 | | | GFA15482 | PLASTIC MPE/A 0.15u/250V J |
| C333 | | | GFA10582 | PLASTIC MPE/A 1u/250V J |
| C351 | | | GFB15482 | PLASTIC MPP/A 0.15u/250VJ |
| C356 | | | GFB30482 | PLASTIC MPP/A 0.3u/250V J |
| C325 | | | GFB47482 | PLASTIC MPP/A 0.47u/250V J |

| SYMBOL | | | PART NO | DESCRIPTION |
|---|---|---|---|---|
| C355 | | | GFB75482 | PLASTIC MPP/A 0.75u/250V J |
| C332 | | | GFD304E2 | PLASTIC MPPS/A 0.3u/400V J (PILKOR) |
| C307 | | | GFD47482 | PLASTIC MPPS/A 0.47u/250V J (MYLAR) |
| C271 | C347 | C401 | GE210252 | PLASTIC PEI/T 0.001u/50V J |
| C40A | C413 | | GE222252 | PLASTIC PEI/T 0.0022u/50V J |
| C111 | C320 | C407 | GE233252 | PLASTIC PEI/T 0.0033u/50V J |
| C601 | | | GE268252 | PLASTIC PEI/T 0.0068u/50V J |
| C128 | C142 | C295 | GE210352 | PLASTIC PEI/T 0.01u/50V J |
| C296 | C327 | C363 | | |
| C603 | | | | |
| C123 | C348 | | GE222352 | PLASTIC PEI/T 0.022u/50V J |
| C316 | C343 | C364 | GE247352 | PLASTIC PEI/T 0.047u/50V J |
| C306 | C317 | C328 | GE210452 | PLASTIC PEI/T 0.1u/50V J |
| C358 | C361 | | | |
| C319 | | | GED562M2 | PLASTIC PPN/A 5600P/800V J |
| C318 | | | GFC622J2 | PLASTIC PPS/A 6200P/2KV J |
| C105 | | | GKA227E5 | POWER ELECT 85oC 220u/400V M |
| C101 | | | GJ047400 | SAFETY X-CAP 0.47u/275V M |
| C102 | | | GJC102E5 | SAFETY Y-CAP/D 1000P/400V M |
| C103 | C104 | C146 | GJH102E5 | SAFETY Y-CAP/S 1000P/400V M |
| C154 | | | | |



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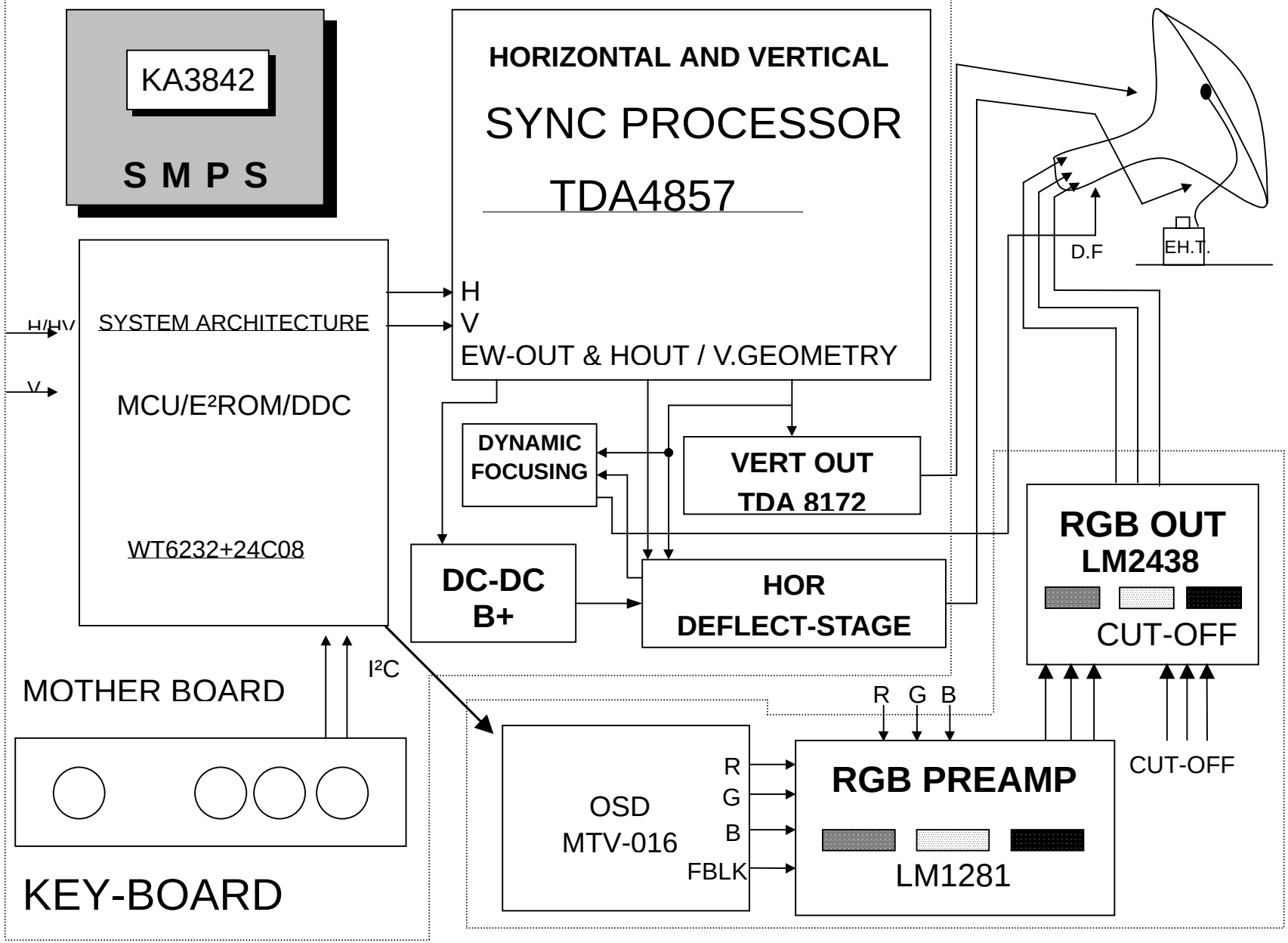
# MS75F-3/AS75F-3(N0701-3)



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# MODEL MS75F-3 / AS75F-3 VIDEO BOARD SCHEMATIC DIAGRAM

| REVISIONS | | | | |
|---|---|---|---|---|
| PCO/ECN NO. | REV. | DESCRIPTION | DATE | DRAWN |
| NN1191011 | 1-3 | DV17D3 | 2001.04.13. | |

| MODEL / LOC | N0501 |
|---|---|
| D212 | 1SS83 |
| D232 | 1SS83 |
| D252 | 1SS83 |
| R201 | 100 1/8W |
| R284 | 1.1K 1/8W |

| MODEL / LOC | DV17D3 |
|---|---|
| R224 | 3K |
| R244 | 2K |
| R264 | 2K |
| | |

NOTE:
1.THE UNIT OF RESISTANCE " OHM " IS OMITTED ( K-1000 OHMS AND M-1MEG OHMS )
2.ALL RESISTORS ARE " 1/8 WATT , 5 % " UNLESS OTHERWISE NOTED.
3.ALL CAPACITANCE RATTING " 50V " IS OMITTED UNLESS OTHERWISE NOTED.

| APPROVAL | NPG DISPLAY LTD. | | |
|---|---|---|---|
| DRAWING BY : GRACE.LIN | Model: N0501/N0701 VIDEO SCH (MS75F-3,AS75F-3) | | |
| CHECK BY : JERRY / R.F.YANG / S.OKUBOO | FILE NAME : 0701V1-4.SCH | DOCUMENT NO. 72000281 | SIZE: A2 REV:1-4 |
| DIRECTOR BY: | | | Date: 2001.04.13. |



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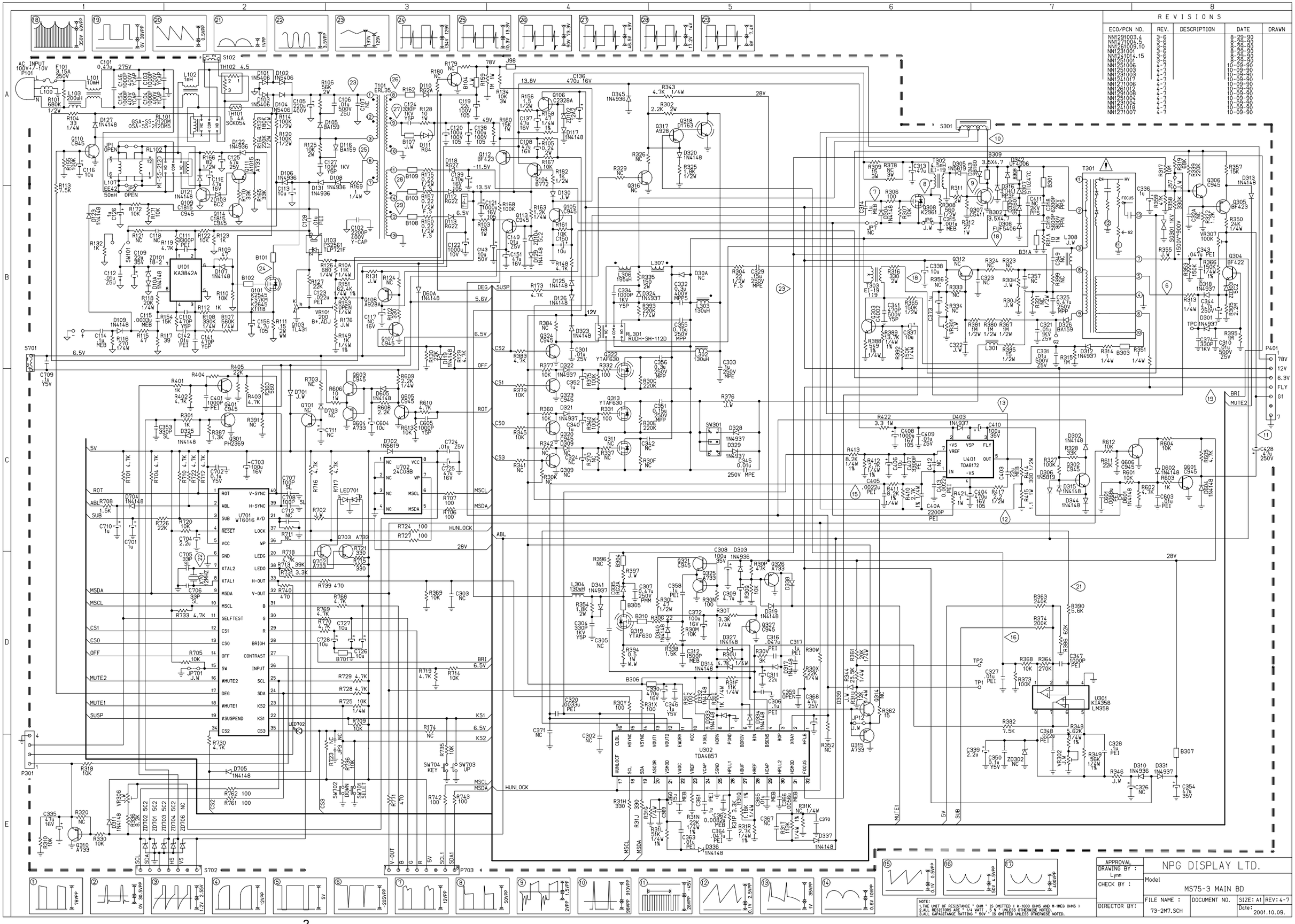
# MODEL MS75F-3 MAIN BOARD SCHEMATIC DIAGRAM


REVISIONS
ECO/PCN NO. | REV. | DESCRIPTION | DATE | DRAWN
NN1291003.4 | 3-6 | | 8-29-90
NN1271004.5 | 4-6 | | 8-29-90
NN1261009.10 | 4-6 | | 8-29-90
NN1231001 | 4-6 | | 8-29-90
NN1241014.15 | 4-6 | | 8-29-90
NN1251001 | 4-6 | | 8-29-90
NN1251006 | 4-7 | | 10-09-90
NN1251003 | 4-7 | | 10-09-90
NN1231003 | 4-7 | | 10-09-90
NN1241017 | 4-7 | | 10-09-90
NN1271006 | 4-7 | | 10-09-90
NN1261012 | 4-7 | | 10-09-90
NN1291008 | 4-7 | | 10-09-90
NN1251004 | 4-7 | | 10-09-90
NN1231004 | 4-7 | | 10-09-90
NN1241018 | 4-7 | | 10-09-90
NN1271007 | 4-7 | | 10-09-90
U101 KA3842A
U102 24C08B
U301 KIA358 LM358
U302 TDA4857
U401 TDA8172
U701 WT6616
U103 PS2561 TLP721F
APPROVAL
DRAWING BY : Lynn
CHECK BY :
DIRECTOR BY:
NPG DISPLAY LTD.
Model
MS75-3 MAIN BD
FILE NAME : 73-2M7.SCH
DOCUMENT NO.
SIZE: A1 REV: 4-7
Date: 2001.10.09.
NOTE:
1.THE UNIT OF RESISTANCE " OHM " IS OMITTED ( K-1000 OHMS AND M-1MEG OHMS )
2.ALL RESISTORS ARE " 1/4 WATT . 5 % " UNLESS OTHERWISE NOTED.
3.ALL CAPACITANCE RATTING " 50V " IS OMITTED UNLESS OTHERWISE NOTED.



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# MODEL AS75F-3 MAIN BOARD SCHEMATIC DIAGRAM

| REVISIONS | | | | |
|---|---|---|---|---|
| ECO/PCN NO. | REV. | DESCRIPTION | DATE | DRAWN |
| NN1291003.4 | 3-6 | | 8-29-90 | |
| NN1271004.5 | 3-6 | | 8-29-90 | |
| NN1261009.10 | 3-6 | | 8-29-90 | |
| NN1231001 | 3-6 | | 8-29-90 | |
| NN1241014.15 | 3-6 | | 8-29-90 | |
| NN1251001 | 3-6 | | 8-29-90 | |
| NN1251006 | 4-7 | | 10-09-90 | |
| NN1251003 | 4-7 | | 10-09-90 | |
| NN1231003 | 4-7 | | 10-09-90 | |
| NN1241017 | 4-7 | | 10-09-90 | |
| NN1271006 | 4-7 | | 10-09-90 | |
| NN1261012 | 4-7 | | 10-09-90 | |
| NN1291009 | 4-7 | | 10-09-90 | |
| NN1251004 | 4-7 | | 10-09-90 | |
| NN1231004 | 4-7 | | 10-09-90 | |
| NN1241018 | 4-7 | | 10-09-90 | |
| NN1271007 | 4-7 | | 10-09-90 | |

| | | | |
|---|---|---|---|
| APPROVAL | NPG DISPLAY LTD. | | |
| DRAWING BY : Lynn | Model | AS75-3 MAIN BD | |
| CHECK BY : | FILE NAME : 73-2M7.SCH | DOCUMENT NO. | SIZE: A1 REV: 4-7 |
| DIRECTOR BY: | | | Date: 2001.10.09. |

NOTE:
1.THE UNIT OF RESISTANCE " OHM " IS OMITTED ! K=1000 OHMS AND M=MEG OHMS !
2.ALL RESISTORS ARE " 1/4 WATT , 5 % " UNLESS OTHERWISE NOTED.
3.ALL CAPACITANCE RATTING " 50V " IS OMITTED UNLESS OTHERWISE NOTED.